On a Collection of Sponges from the Abrolhos Islands, Western Australia.

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(Plates 25 & 26.)

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Introduction.

The collection of Sponges made by Professor Dakin at the Abrolhos Islands is a very rich and, in some respects, a very remarkable one. It comprises 48 determinable species, of which 12 are regarded as new. The collection is especially rich in Calcarea, and includes a number of fine specimens of that extremely rare and interesting sponge *Grantiopsis cylindrica*; a new species of the no less rare and remarkable genus *Lelapia*, and a new genus of Leucascidæ. The Tetraxonida, as usual, form the bulk of the collection, but do not include any very striking novelties; there are, however, two rather remarkable new species of Euceratosa.

The following is a complete list :—

Order **CALCAREA**.

Family Homocœlidæ.

1. *Leucosolenia grisea* n. sp.
2. *Leucosolenia protogenes* Haeckel.

Family Leucascidæ.

3. *Ascoleucetta compressa* n. gen. et sp.
4. *Leucetta chagosensis* Dendy.
5. *Leucetta microraphis* Haeckel.

Family Leucaltidæ.

6. *Leucaltis clathria* Haeckel.

Family Sycettidæ.

7. *Sycon gelatinosum* de Blainville.

Family Heteropiidæ.

8. *Vosmaeropsis mackinnoni* n. sp.

Family Grantiidæ.

9. *Grantiopsis cylindrica* Dendy.

9 *a*. *Grantiopsis cylindrica* Dendy var. *fruticosa* nov.

Family Lelapiidæ.

10. *Lelapia antiqua* n. sp.

Order **TETRAXONIDA**.

Sub-order Homosclerophora.

Family Plakinidæ.

11. *Dercitopsis minor* Dendy.
12. *Dercitopsis mammillaris* (Lendenfeld).

Sub-order Astrotetraxonida.

Family Stellettidæ.

13. *Stelletta brevis* Hentschel.
14. *Stelletta debilis* Thiele.
15. *Stelletta sigmatriæna* Lendenfeld.
16. *Ancorina australiensis* (Carter).
17. *Ancorina brevidens* n. sp.
18. *Aurora rowi* Dendy.
19. *Asteropus simplex* (Carter).

Family Erylidæ.

20. *Erylus proximus* Dendy.

Family Donatiidæ.

21. *Donatia robusta* (Bowerbank).
22. *Donatia multistella* (Lendenfeld).

Family Chondrosiidæ.

23. *Chondrilla australiensis* Carter.

Sub-order Sigmatotetraxonida.

Family Haplosclerida.

24. *Reniera aquæductus* Schmidt.
25. *Reniera cribricutis* Dendy.
26. *Reniera permollis* (Bowerbank).
    Reniera spp.
27. *Petrosia dura* (Nardo) Vosmaer.
28. *Halichondria phakellioides* n. sp.
29. *Chalina palmata* (Lamarck).
    Chalina sp.
    Pachychalina sp.
30. *Ceraochalina multiformis* var. *manaarensis* Dendy.
31. *Phlœodictyon abrolhosensis* n. sp.

Family Desmacidonidæ.

32. *Pseudoesperia carteri* n. sp.
33. *Pseudoesperia trichophora* n. sp.
34. *Esperella plumosa* Carter.
35. *Biemna tubulata* Dendy.
36. *Echinodictyum bilamellatum* (Lamarck) Ridley.
37. *Anchinoë fictitioides* n. sp.
38. *Dendoricella schmidti* (Ridley).

Family Clavulidæ.

39. *Trachycladus lævispirulifer* Carter.
40. *Sigmosceptrella fibrosa* Dendy.
41. *Spirastrella vagabunda* Ridley.
42. *Aaptos aaptos* (Schmidt).
43. *Polymastia mammillaris* (O. F. Müller) Bowerbank.

Order **EUCERATOSA.**

Family Darwinellidæ.

44. *Megalopastes arenifibrosa* n. sp.

Family Spongeliidæ.

45. *Spongelia dakini* n. sp.
46. *Psammopemma crassum* Carter var.

Family Spongiidæ.

47. *Hippospongia intestinalis* (Lamarck).
48. *Coscinoderma pyriforme* Lendenfeld var. *α*.
48 *a*. *Coscinoderma pyriforme* Lendenfeld var. *β*.

As might be expected from the position of the Abrolhos Islands, the sponge fauna is mainly intermediate in character between that of the more westerly Indian Ocean and that of the more easterly Australian coasts, but it contains a small element apparently derived from the North, viz. *Lelapia antiqua*, nearly related to the Japanese *L. nipponica* ; *Stelletta debilis*, previously known only from Ternate, and *Ancorina brevidens*, very closely related to *Ancorina amboinensis* from Amboina ; while *Echinodictyum bilamellatum*, though widely spread on the eastern coasts of Australia, seems to be a characteristically tropical or sub-tropical species.

We have to record our indebtedness to Professor W. J. Dakin, D.Sc., for the opportunity of studying this valuable collection ; to Mr. M. Burton, M.Sc., for determining the two species of *Donatia*, a genus to which he has devoted special attention ; to Mr. Charles Biddolph, the skilled assistant in the Zoological Department of King's College, for the photographic illustrations, and to Mr. J. C. Dendy for help in section-cutting.

1. Leucosolenia grisea n. sp. (Pl. 25. fig. 1; Pl. 26. fig. 1.)

There are two specimens in the collection, the larger (R.N. VI. 21), which is attached to a rock by its base, is plicate, consisting of vertical lamellæ which fold and branch in such a way as to lie parallel to one another (Pl. 25. fig. 1). The total height of the specimen is 30 mm., the total width 25 mm., and the average thickness of the lamellæ 1·5 mm. The second specimen (R.N. IV. 3 *a*) consists of a curved lamella, forming an imperfect funnel 20 mm. in height and 10 mm. in diameter at the top.

The surface is smooth, even and sieve-like in appearance, owing to the pseudopores which are thickly and evenly scattered all over it. The oscula, which are marginal in position, are about 1 mm. in diameter and have a slightly prominent margin. Colour in spirit grey; texture firm and compact.

The pseudopores, which are nearly circular and measure about 0·26 mm. in diameter, pierce the pseudoderm, which is about 0·07 mm. in thickness, and lead into wide, irregular interspaces lying between the branching and anastomosing Ascon tubes. The prosopyles are accompanied by groups of black pigment granules which doubtless indicate the porocytes, as in the case of *Leucosolenia coriacea* as described by Minchin [1900], and in that of *Leucosolenia cavata* Dendy [1891]; it is the presence of this jet-black pigment which gives the sponge its characteristic grey colour. The granules are not confined to the porocytes, but are also found scattered in the flat epithelium. The secondary Ascon tubes open into the main exhalant canals, which are also lined by basinucleate collared cells, and open to the exterior by true oscula.

The canal system conforms to type B. (Dendy [1891].)

The skeleton consists of triradiate and quadriradiate spicules arranged irregularly in one or more layers in the walls of the Ascon tubes; the triradiates are more densely packed in the thick pseudoderm.

Spicules:—(1) Triradiates (Pl. 26. fig. 1 *a*); equiangular; rays measuring about 0·14 mm. by 0·013 mm.; straight, conical, rather bluntly pointed; usually equiradiate, but the basal sometimes a little longer than the oral rays.

(2) Quadriradiates (Pl. 26. fig. 1 *b*); rather scarce, like the triradiates but with the addition of a long, slender, slightly curved and sharply pointed apical ray which projects into the gastral cavity.

This species is readily recognised by its characteristic external form and its grey colour, due to the black pigment granules.

Register Nos. and Localities. IV. 3 *a*, Wooded Isle; VI. 21, Sandy Isle.

2. Leucosolenia protogenes *Haeckel*. (Pl. 25. fig. 2.)

(For discussion and synonymy *vide* Dendy [1891].)

There is in the collection a single small specimen (Pl. 25. fig. 2) of this common Australian species.

Register No. and Locality. VIII. 4, Sandy Isle.

Genus Ascoleucetta n. gen.

Leucascidæ with a well-developed dermal cortex densely packed with large and small triradiates and pierced by well-defined inhalant apertures guarded each by a fringe of hair-like oxea projecting radially inwards from within the margin. The elongated and much branched flagellate chambers are more or less radially arranged around the wide exhalant canals, which open by numerous oscula.

3. Ascoleucetta compressa n. sp. (Pl. 25. fig. 3; Pl. 26. figs. 2, 3, 4, 5.)

The sponge, which measures 25 mm. in height, 22 mm. in greatest width, and has an average thickness of 4 mm., forms an erect, compressed, irregular, more or less lobulated mass. The surface is smooth but uneven, and sieve-like in appearance owing to the presence of numerous small, circular, inhalant apertures, about 0·2 mm. in diameter, which are closely and uniformly scattered all over it. The oscula, which measure about 1 mm. in diameter, are arranged singly and are for the most part marginal. Colour in spirit light greyish brown; texture firm and compact, rather hard.

The inhalant apertures (Pl. 26. fig. 5) pierce the well-developed dermal cortex, which is about 0·13 mm. in thickness, and lead into large, well-defined inhalant canals which run in between the flagellate chambers. The latter are much elongated and copiously branched; they tend to be radially arranged round the larger exhalant canals, with their blind ends directed more or less at right angles towards the dermal surface (Pl. 26. figs. 3, 4). The chambers, whose walls are pierced by numerous prosopyles, open into wide exhalant canals which lead up to the vents. The collared cells are basi-nucleate and confined to the radial chambers, being absent from the exhalant canals.

The skeleton consists of triradiates and quadriradiates, for the most part equiangular and equiradiate. The dermal cortex (Pl. 26. fig. 5) contains numerous large triradiates arranged tangentially, intermingled with small triradiates which are packed in a dense feltwork around the margins of the inhalant apertures. These apertures are guarded by a fringe of hair-like oxea projecting radially inwards from the margin in small groups (Pl. 26. fig. 5). There are no large spicules in the interior of the sponge, small tri- and quadriradiates being scattered closely but irregularly in the walls of the radial chambers and exhalant canals, the facial rays lying tangentially, while the slender apical rays of the quadriradiates project into the chambers and into the exhalant canals.

Spicules:—(1) Large triradiates (Pl. 26. fig. 2 *a*); with conical, straight or slightly crooked, gradually or sometimes rather abruptly sharp-pointed rays, measuring about 0·35 by 0·052 mm.

(2) Small triradiates (Pl. 26. fig. 2 *b*); with straight, conical, bluntly pointed rays, measuring up to 0·14 by 0·03 mm. All the triradiates are

equiangular and more or less equiradiate, but sometimes the rays become slightly unequal.

(3) Quadriradiates of three kinds: (*a*) (Pl. 26. fig. 2 *c*), regular, very abundant, like the small triradiates with the addition of a slender, curved, often crooked, apical ray; the facial rays measure about 0·15 by 0·035 mm.: (*b*) (Pl. 26. fig. 2 *d*), sagittal, with a wide oral angle and a slender, backwardly directed, very slightly curved apical ray; the oral rays (which measure up to 0·13 by 0·02 mm.) are sometimes slightly curved, the basal ray is slightly shorter than the oral and straight and conical; these spicules are not very abundant and are probably confined to the exhalant canals and the oscular margin: (*c*) (Pl. 26. fig. 2 *e*), sagittal, small, very irregular, usually with curved, crooked rays, measuring about 0·1 by 0·019 mm. (*b*) and (*c*) have only been found in boiled-out preparations.

(4) Trichoxea (Pl. 26. fig. 5, *tr.*) very slender, sharp-pointed, measuring about 0·16 mm. in length.

Register No. and Locality. III. 12, Wooded Isle.

4. Leucetta chagosensis *Dendy*.

Leucetta chagosensis Dendy [1913].

There are two specimens in the collection. One (R.N.II.4), which measures 32 mm. in length, 16 mm. in height, and has an average thickness of 8 mm., is compressed and irregular, proliferating into short, nodular processes; the vents, which have slightly prominent margins, are scattered and vary in size between 1 and 2 mm. The second specimen (R.N. II. 5 *b*) consists of three small lobose fragments which have been broken off a larger specimen.

The Abrolhos specimens agree closely with the type except that the ectosome is thinner and the subdermal cavities slightly smaller. Numerous embryos are present, the structure of which indicates clearly that the larva of *Leucetta* is a parenchymula.

Previously known Distribution. Chagos Archipelago, Indian Ocean (*Dendy*).

Register Nos. and Locality. II. 4, II. 5 *b*, Wooded Isle.

5. Leucetta microraphis *Haeckel*.

Leucetta primigenia var. *microraphis* Haeckel [1872].
Leuconia dura Polejaeff [1883].
Leucetta primigenia var. *microrrhaphis* Ridley [1884].
Leucetta microrhaphis Lendenfeld [1885].
Leucandra microrhaphis Dendy [1892].
Leucetta microraphis Dendy & Row [1913].

The single specimen consists of a small, oblong fragment measuring about 22 by 10 mm.; at one end there is a small slit-like vent measuring about 2 by 1 mm. Colour in spirit light brown; texture very hard and coarse.

The skeleton consists of triradiate spicules only; these are of two sizes and scattered irregularly throughout the sponge except at the surface, where

they are arranged tangentially. The rays of the large triradiates measure up to 1·1 by 0·23 mm., those of the smaller 0·18 by 0·013 mm.

Previously known Distribution. Bermudas (*Poléjaeff*); Australia (*Poléjaeff, Ridley, Lendenfeld, Dendy*).

Register No. and Locality. VI. 17 *b*, Sandy Isle.

6. Leucaltis clathria *Haeckel.*

(For literature and synonymy *vide* Dendy and Row [1913].)

There are two very fine specimens of characteristic external form, each measuring about 80 mm. in diameter.

Previously known Distribution. See Dendy [1913].

Register No. and Locality. III. 3, IV. 2, Wooded Isle.

7. Sycon gelatinosum *de Blainville.*

(For literature and synonymy *vide* Dendy and Row [1913].)

There are six specimens of this common Australian species in the collection, usually forming colonies of several or many persons, but varying considerably in the size of person and in the way in which the colony branches; the largest person measures 25 mm. in height and 12 mm. in greatest diameter.

The colour in spirit varies from light yellowish brown to dull greyish brown. The oscula are all provided with a fringe of spicules.

There is one specimen (R.N. VII. 1 *d*) consisting of a single person only; it is 16 mm. in height and has an average diameter of 7 mm.; the colour in spirit is almost white.

The internal structure and spiculation of all the specimens are typical.

Previously known Distribution. Australia (various authors and collections); Java (*Haeckel*).

Register Nos. and Localities. II. 2, II. 5 *a*, III. 2, III. 13 *a*, III. 13 *b*, Wooded Isle; VII. 1 *d*, Sandy Isle.

8. Vosmaeropsis mackinnoni n. sp. (Pl. 25. fig. 4; Pl. 26. fig. 6.)

Sponge (Pl. 25. fig. 4) colonial, consisting of a number of short, thick, subcylindrical individuals united together in an irregular manner along a greater or lesser portion of their length. Each individual has a circular or oval osculum at its summit; in perfect individuals a beautiful oscular fringe is present, formed of very long, hair-like oxea; in others this fringe is broken off short. The individuals vary rather in size owing to their peculiar branching and colonial habit; an average full-grown person is 15 mm. in height and 3 mm. in diameter, the thickness of the wall being 1·3 mm. The outer surface is rough and uneven, and large oxea can be seen projecting irregularly from it; these oxea are more or less absent from the basal portions of the sponge, where the surface is much more even and only slightly roughened. Colour in spirit pale brown; texture rather fragile.

Both dermal and gastral cortices are well developed, the former about 0·18 and the latter about 0·1 mm. thick. Between these lies the chamber layer with a thickness of about 1 mm.

The canal system is "sylleibid," the elongated flagellate chambers, up to 0·4 mm. in length, opening into wide exhalant canals, which interdigitate with the main inhalant canals running in from beneath the dermal cortex. Small, scattered dermal pores lead into much narrower inhalant canals, which pierce the dermal cortex to open into the wide outer ends of these main inhalant canals.

The collared cells are apicinucleate.

The skeleton of the dermal cortex consists of tangentially placed triradiates of various sizes, beneath which lie the short rays of the subdermal pseudosagittal triradiates.

The skeleton of the gastral cortex consists exclusively of rather slender triradiates arranged tangentially, which become strongly sagittal (alate) towards the osculum, with the oral arms extended parallel with the margin of the latter.

The skeleton of the chamber layer consists of (1) the contripetally directed rays of the large subdermal pseudosagittal triradiates, (2) very large and stout subgastral sagittal triradiates, (3) similar triradiates whose paired rays lie at a variable distance beneath the gastral cortex, (4) the inner portions of the large oxea, whose outer portions project through the dermal cortex.

Spicules:—(1) Triradiates of the dermal cortex (Pl. **26**. fig. 6 *d*) ; approximately regular, with conical, gradually tapering, sharply-pointed rays, measuring from about 0·23 by 0·026 to 0·4 by 0·04 mm.

(2) Triradiates of the gastral cortex (Pl. **26**. fig. 6 *e*) ; approximately regular and more or less strongly sagittal; much smaller on the average than those of the dermal cortex, with slender, gradually tapering, sharply-pointed rays measuring about 0·21 by 0·013 mm.

(3) Subdermal pseudosagittal triradiates (Pl. **26**. fig. 6 *c*) ; the three rays are all different ; the true basal ray, now forming a false pair with one of the orals, is the shortest of the three and straight or nearly so, conical and gradually sharp-pointed, measuring, say, 0·21 by 0·026 mm. ; the oral ray which forms an apparent pair with the basal is rather longer, measuring, say, 0·26 by 0·026 mm., and more or less crooked ; the other oral ray, now centripetally directed, is much longer and more slender, measuring, say, 0·5 by 0·02 mm., perfectly straight and gradually sharp-pointed.

(4) Subgastral sagittal triradiates (Pl. **26**. fig. 6 *b*) ; very large and stout, rays conical, gradually and sharply pointed, oral rays often slightly curved or crooked, basal ray (centrifugally directed) longer than orals; oral rays measuring, say, 0·41 by 0·04 mm., with basal 0·52 by 0·05 mm., but variable.

(5) More distal triradiates of the chamber layer (Pl. **26**. fig. 6 *b*) ; not sharply distinguishable from (4), but usually with shorter basal rays and straighter orals.

(6) Large oxea (Pl. **26**, fig. 6 *a*), echinating the outer surface of the sponge; stout, curved, often crooked, especially the outer part, the inner portion being straighter and tapering more gradually; fairly sharply pointed at each end; measuring up to 1·2 by 0·06 mm.

(7) Oxea of the peristomial fringe; very long and slender, hair-like, usually broken off; measuring up to 2·3 by 0·009 mm.; outer ends hastate, very sharply pointed.

It is quite possible that this species may prove to be identical with one or other of two species in the Hamburg South-west Australian collection for which the late Mr. Row proposed the names *Vosmaeropsis dendyi* and *V. primitiva*. These names are given in Dendy and Row's "Classification and Phylogeny of the Calcareous Sponges" [1913], but no descriptions have yet been published. Beyond the fact that the species in question belong to the same section of the genus as *V. mackinnoni*, it is impossible at the present time to say anything about them, as the specimens have been sent to Japan for further investigation by Dr. Sanji Hōzawa.

Register No. and Locality. IV. 1, Wooded Isle.

9. Grantiopsis cylindrica *Dendy*. (Pl. **25**. figs. 5, 6, 7, 8; Pl. **26**. fig. 7.)

Hypograntia infrequens Carter [1885–6].
Grantiopsis cylindrica Dendy [1892, 1893 A].
Grantiopsis cylindrica Dendy & Row [1913].
Grantiopsis infrequens Dendy & Row [1913].

There are five specimens in the collection, which vary slightly in size and appearance; each consists of a single person only.

R.N. I. 1 (Pl. **25**. fig. 8) is typical; it is attached to a rock by its base, and forms a slightly curved, cylindrical tube, 20 mm. long and 5 mm. in diameter, with a slightly constricted, terminal osculum, almost without fringe; the wall of the tube is 1 mm. in thickness. The surface is almost smooth, with a characteristic glistening appearance due to the presence of the large tangential triradiates. Colour in spirit almost white; texture firm and compact, but brittle. Other typical specimens are shown in figs. 5–7.

The skeleton arrangement, the form and size of the spicules, and the canal system agree closely with those of the type of the species as described by Dendy [1892], and a detailed description is therefore not necessary. As, however, the spicules have not as yet been figured separately, but only in the transverse section given by Dendy [1893 A], we take this opportunity of supplementing his description with the necessary illustrations (Pl. **26**. fig. 7, *a–h*; *vide* also Description of Plates).

In their "Classification and Phylogeny of the Calcareous Sponges" [1913], Dendy and Row have pointed out that Carter's *Hypograntia infrequens* is undoubtedly a species of *Grantiopsis*, but, according to Mr. Row's observations on material collected by the Hamburg South-west Australian Expedition,

different specifically from *G. cylindrica*. We are now in a position, however, as the result of microscopical examination of the very small, fragmentary type in the British Museum, to state that *Hypograntia infrequens* and *Grantiopsis cylindrica* are specifically identical. This being the case, it might be argued that both the generic and the specific names proposed by Carter should take priority.

As to the generic name *Hypograntia*, it must be pointed out, in the first place, that the diagnosis of this genus contains nothing that is distinctive, and is founded upon an obvious error with regard to the structure of the canal-system, and, in the second place, that although *Hypograntia infrequens* is the first of six species described in the same paper, it is said to be "*incertæ sedis*," so that it cannot reasonably be regarded as the type of the genus, and as it is quite distinct generically from the five remaining species, it seems advisable to retain the generic name *Grantiopsis* (originally regarded as a subgenus of *Grantia*).

As to the specific name *infrequens*, it must be pointed out that Carter's description of the species is quite unrecognisable. He altogether omits the most characteristic feature of the sponge, viz. the reduced tubar triradiates, and describes the subgastral quadriradiates as triradiates. It was only the fact that we happened to have access to Mr. Carter's manuscript drawings that put us on the track of the identification. Even in these drawings the reduced tubar triradiates are not shown. Had the identification been established before the publication of the name *Grantiopsis cylindrica*, it would doubtless have been better to call the species *Grantiopsis infrequens*, but as the former name has now become established in the literature and as Mr. Carter's species was not recognisably described, we see no sufficient reason for reverting to his name.

Previously known Distribution. Port Phillip Heads (*Dendy*, *Carter*).

Register No. and Locality. I. 1, VI. 17 *c*, VII. 1 *a*, VII. 1 *b*, VII. 1 *c*, Sandy Isle.

9 *a*. Grantiopsis cylindrica *Dendy* var. fruticosa nov. (Pl. 25. fig. 9.)

The specimen, which is colonial, branched and bushy, consists of about 14 persons united together at their bases by short connections; each person forms a slightly curved cylindrical tube with a circular osculum at the summit without projecting fringe; the persons average only 12 mm. in length, with a nearly uniform diameter of 3·5 mm.; they have an almost smooth surface, with a characteristic glistening appearance due to the presence of the large tangential triradiates. Colour in spirit very pale coffee-brown; texture compact and firm. The skeleton arrangement, canal system and spiculation agree so closely with those of the typical form that no detailed description is necessary.

The variety differs from the type of the species chiefly in its bushy habit and the smaller size of the individual persons, but also in that the dermal

cortex forms only about one-third of the total thickness of the tube as compared with about half in the typical form, while the spicules generally are slightly smaller and the rays of the large dermal triradiates somewhat shorter and blunter.

Register No. and Locality. III. 4, Wooded Isle.

10. Lelapia antiqua n. sp. (Pl. 25. fig. 10 ; Pl. 26. fig. 8.)

The single specimen, which is attached by its lower end to a piece of calcareous débris, measures 20 mm. in height and 10 mm. in greatest diameter. It is erect, club-shaped, somewhat curved upon itself and slightly flattened in one plane. The single oval osculum, which measures 3 by 2 mm., is nearly terminal in position and has a well-developed, collar-like peristome. The surface of the lower two-thirds of the spongs is smooth ; that of the upper third is coarsely and unevenly hispid, owing to large projecting brushes of long, slender oxea. Colour in spirit light yellowish grey ; texture firm.

The dermal cortex is about 0·42 mm. thick, the gastral cortex about 0·13 mm., and the chamber layer, between the two, about 1·95 mm.

There appear to be numerous small dermal pores scattered over the surface, but now very difficult to recognize. Short and narrow canals lead from the surface into large and very irregular crypts in and beneath the dermal cortex, from which the rather wide inhalant canals run radially inwards. The canal system is typically leuconoid. The flagellate chambers, thickly scattered in the clear, gelatinous mesoglœa, are oval and about 0·1 mm. in longer diameter. The main exhalant canals open radially into the large central gastral cavity.

The collared cells are apicinucleate.

The skeleton of the dermal cortex consists of two very distinct parts : (1) several layers of slender-rayed, normal sagittal triradiates, arranged tangentially, the whole about 0·085 mm. thick ; (2) a deeper and thicker part, consisting of longitudinal bundles of huge oxea, the whole about 0·34 mm. thick. The dense brushes of slender oxea that project from the surface may also be included with the skeleton of the dermal cortex.

The skeleton of the chamber layer consists of (1) a confused interlacement of huge oxea, lying in all directions ; (2) radially or subradially arranged fibres or bundles of tuning-fork spicules, with the unpaired rays directed outwards ; (3) the basal rays of subgastral sagittal triradiates.

The skeleton of the gastral cortex consists of several layers of alate triradiates lying tangentially but otherwise without definite arrangement, backed by the oral rays of the subgastral sagittal triradiates.

The skeleton of the peristome is rather remarkable ; there is no fringe of freely projecting spicules, but a thin peristomial membrane supported by a dense but approximately single layer of huge oxea, which are really a continuation of the deeper skeleton of the dermal cortex, lined by a layer of

alate quadriradiates with short apical rays, forming a continuation of the gastral skeleton, but with the paired rays arranged more regularly, parallel with the oscular margin.

Spicules:—(1) Normal sagittal triradiates of the dermal cortex (Pl. 26. fig. 8 *c*); with slender, gradually sharp-pointed rays; the oral angle is very wide and the oral rays measure about 0·23 by 0·014 mm.; the straight basal ray is longer than the orals and measures, say, 0·4 by 0·013 mm.

(2) Subgastral sagittal triradiates (Pl. 26. fig. 8 *c'*); these are like the normal sagittal triradiates except that the rays are stouter and the orals more distinctly recurved; the orals measure up to 0·3 by 0·026 mm., with the basal 0·5 by 0·03 mm.

(3) Laterally extended (alate) triradiates of the gastral cortex (Pl. 26. fig. 8 *d*); the oral rays are straight or very slightly recurved, gradually sharp-pointed, measuring up to 0·31 by 0·016 mm., and the oral angle is so wide that the rays are almost in the same straight line; the basal ray is very short, straight and conical, measuring about 0·04 by 0·01 mm.

(4) Alate quadriradiates of the peristome (Pl. 26. fig. 8 *e*); these are similar to the alate triradiates, with the addition of a very short, straight, sharp-pointed apical ray.

(5) "Tuning-fork" spicules (Pl. 26. fig. 8 *f*); with straight, slender, gradually sharp-pointed rays; the basal ray is the longest and stoutest, measuring about 0·4 by 0·009 mm.; the two oral rays, which are slightly unequal in length, run straight forward parallel to one another; the longer of the two measures about 0·21 by 0·006 mm.

(6) Large stout oxea (Pl. 26. fig. 8 *a*); fusiform, slightly curved, sometimes a little irregular in shape and diameter, tapering gradually to a sharp point at each end; full-grown spicules measure up to 2·0 by 0·09 mm.

(7) Slender oxea of the dermal brushes (Pl. 26, fig. 8 *b*); straight or very slightly curved, gradually sharp-pointed, sometimes slightly hastate, measuring up to 1·6 by 0·007 mm., but often less.

This species closely resembles *Lelapia australis* Carter, as described and figured by Dendy [1893 B], but differs in the absence of microxea ("mortar spicules") and in the presence of a definite layer of large, longitudinally placed oxea in the deeper part of the dermal cortex. In the latter respect it occupies an intermediate position between *Lelapia australis* and *Lelapia nipponica*, a remarkable Japanese species described by Hara [1894]. We have been unable to obtain access to the description of this species, but, thanks to the kindness of Dr. Hōzawa, have been able to examine a number of transverse sections *. It is obvious that *Lelapia nipponica* is a much more primitive species than *L. australis*. The bundles of "tuning-fork" spicules are arranged almost strictly radially, with the unpaired rays centrifugally directed, and clearly represent the articular tubar skeleton, though the canal

* Since this paper was read, Dr. Hōzawa [1923] has published an illustrated description of the Japanese species and proposed for it the new genus *Paralelapia*.

system is already of the leuconoid type. The large oxea are confined to the dermal cortex, where they form a well-defined layer, and have not yet invaded the chamber layer as in *L. australis* and, to a less extent, in *L. antiqua*. There are other minor differences distinguishing *L. nipponica* from either of the Australian species, but the material in our possession is not sufficient to elucidate all these.

It is clear that *Lelapia antiqua* is intermediate in structure between the more primitive *L. nipponica* and the less primitive *L. australis*, and it is interesting to note that it also occupies an intermediate position geographically, *L. australis* having been found so far only off the Victorian coast.

Register No. and Locality. VII. 1 *e*, Sandy Isle.

11. Dercitopsis minor *Dendy* [1916 B].

There is one specimen in the collection. The sponge, which measures 42 mm. in length, 25 mm. in breadth, and has an average thickness of 7 mm., forms an irregular, oval, cushion-like mass, concave below, and probably grew on the back of a crab. The margins are broadly rounded. The surface is smooth and minutely punctate. The vents are small and few in number, scattered singly over the upper surface. Inhalant pores are closely scattered over the surface. Colour of surface in spirit varying from light brown to dark slate-grey, internally dull yellow ; texture firm and compact.

The skeleton consists of a dense feltwork of loose spicules irregularly arranged except at the surface, where there is a dermal layer of perpendicularly arranged oxea. The spiculation agrees closely with that of the type.

The ectosome and choanosome are not sharply differentiated, but the former contains many more spicules. There is no fibrous tissue in the ectosome. The mesogloea of the choanosome is finely and uniformly granular. The dermal pores lead into short inhalant canals, which penetrate the ectosome and lead into large crypts from which the inhalant canals of the choanosome originate. The canal system is diplodal, not eurypylous as described for *Dercitopsis ceylonica* Dendy. The flagellate chambers are large and pouch-like, with a short wide aphodus and a short narrow prosodus ; they measure about 0·04 mm. in longer diameter. The exhalant and inhalant canaliculi of the chambers are lined by flattened epithelium, the nuclei of which can be seen. The collared cells are apicinucleate. Small round testes are scattered in the deeper parts of the choanosome, in which spermatogenesis is clearly shown. Tailed spermatozoa are present. There is no trace of ova, so the species is probably dioecious.

Previously known Distribution. Indian Ocean (*Dendy*).

Register No. and Locality. II. 1, Wooded Isle.

12. Dercitopsis mammillaris (*Lendenfeld*).

Plakinastrella mammillaris Lendenfeld [1906].

Dercitopsis mammillaris Dendy [1916 B].

The single specimen is of depressed cushion-like form, and has apparently been attached by a broad base to the vertical side of a rock, for two large

oval vents, 3·5 mm. in diameter, with slightly prominent margins, occur on one edge. Microscopic inhalant pores are thickly scattered over the smooth surface. Colour in spirit light greyish brown ; texture firm and compact.

The skeleton consists of a thick feltwork of loose, irregularly arranged spicules. There is a dense layer of oxea at the surface, largely but not entirely radially arranged.

Spicules :—(1) Tetracts ; with smooth, sharp-pointed rays measuring from 0·093 to 0·2 mm. in length and from 0·018 to 0·04 mm. in thickness.

(2) Diacts (oxea) ; smooth, fusiform, slender, slightly curved, gradually sharp-pointed, sometimes with a kink or an enlargement near the middle, measuring from 0·06 to 0·14 mm. in length and from 0·004 to 0·005 mm. in thickness. The oxea are more numerous than the tetracts. Triacts are absent.

The dermal pores lead into short, narrow, inhalant canals piercing the densely spiculated ectosome, beneath which they unite to form sub-cortical crypts from which the inhalant canals of the choanosome originate. The canal system is diplodal, the aphodi and prosodi being longer and narrower than in *Dercitopsis minor* Dendy. The flagellate chambers are sub-spherical, measuring about 0·04 mm. in diameter. The narrow exhalant canals gradually pass into wider ones, which in turn open into the wide oscular tubes. The main inhalant canals are surrounded by collenchymatous mesoglœa devoid of spicules ; the main exhalant canals are probably like the inhalant, but as no sections have been taken through a vent this cannot be proved. The mesoglœa between the chambers is finely granular.

Testes are irregularly scattered in the choanosome ; they are rounded sacs lined by an epithelium and containing various stages in the development of spermatozoa. Segmenting embryos are also present ; the sponge is therefore hermaphrodite and presumably protogynous.

Previously known Distribution. West coast of Australia (*Lendenfeld*).

Register No. and Locality. II. 13, Wooded Isle.

13. Stelletta brevis *Hentschel* [1909].

The single specimen, a cushion-like mass which has probably been torn off a rock, measures 38 mm. in length, 25 mm. in breadth, and 15 mm. in thickness. Surface smooth but finely granular. Oscula not visible. The surface colouring in spirit varies from a very light brown to a violet-grey, that of the interior is light brown.

The sponge possesses a well-developed cortex. Immediately beneath the surface is a thin layer of strongylasters, then comes a non-fibrous portion filled with minute brown pigment granules and containing inhalant chones ; below this is a light-coloured, non-pigmented, fibrous layer. Between the cortex and the choanosome are large sub-cortical crypts. The choanosome, in which oxyasters are thickly scattered, contains narrow inhalant canals.

The skeleton, which agrees closely with that of Hentschel's South-West Australian specimen, consists of radially arranged bundles of plagiotriænes and oxea ; in the deeper parts there is less regularity. The spicules resemble closely those of the type in size and appearance.

Previously known Distribution. Sharks Bay, S.W. Australia (*Hentschel*).

Register No. and Locality. VI. 8, Sandy Isle.

14. Stelletta debilis *Thiele.*

Stelletta debilis Thiele [1900].

Stelletta debilis Lendenfeld [1903].

The single complete specimen is sub-spherical in shape, measuring 15 mm. in diameter, There is a single oval osculum, 2 mm. long and 1 mm. broad, near the point of attachment of the sponge to a piece of rock. Inhalant pores are thickly scattered all over the slightly roughened surface between the cladi of the triænes. Colour in spirit light brown ; texture firm and compact, but compressible.

There is a slightly fibrous cortex, and the skeleton is radially arranged and quite typical.

Spicules :—(1) Orthotriænes ; shaft straight or nearly straight, tapering gradually to a sharp point, measuring 1·35 by 0·026 mm. ; cladi sharply pointed, recurving at once so as to extend at right angles to the shaft, measuring 0·16 mm. in length.

(2) Anatriænes ; these frequently project beyond the surface of the sponge ; shaft long, slender, slightly curved, measuring 1·3 by 0·015 mm. ; cladi well developed and markedly recurved, measuring 0·052 mm. in length.

(3) Oxea ; fusiform, usually curved, sharp-pointed, measuring 1·1 by 0·02 mm. ; these are most abundant in the deeper parts of the sponge.

(4) Oxyasters ; with 6 to 10 slender, sharp-pointed rays and no distinct centrum ; diameter 0·017 mm. ; these are scattered sparsely throughout choanosome and ectosome.

Previously known Distribution. Ternate (*Thiele*).

Register No. and Locality. II. 16, Wooded Isle.

15. Stelletta sigmatriæna *Lendenfeld* [1906].

There are two small, complete specimens, sub-spherical in shape, 12 and 8 mm. in diameter respectively. Inhalant pores, visible with a lens, are scattered evenly over the smooth surface. Each specimen has one minute oval osculum lying in a slight depression. Colour in spirit buff.

The skeleton consists of radially arranged oxea and triænes, not concentrated into bundles. Just beneath the surface the cladi of the triænes form a sharply-defined layer ; their shafts pierce the region of the chones, which is cladome-free. In the choanosome are radially placed anatriænes, orthotriænes in various stages of development, and less regularly arranged oxea.

Spicules :—(1) Orthotriænes ; shaft straight, gradually pointed, measuring about 1·1 by 0·015 mm. ; the cladi, which are about 0·3 mm. long, at first form with the shaft an angle of about 120°, but somewhere along their length they abruptly turn back so that their distal ends are at right angles to the shaft.

(2) Anatriænes ; shaft straight, gradually tapering to a sharp point, measuring about 1·1 by 0·03 mm. ; the sharply-pointed cladi, which are about 0·15 mm. long, curve outwards almost at right angles to the shaft and then run back parallel to it.

Our specimen contains only a few of the irregular orthotriænes and of the sigma-like anatriænes figured by Lendenfeld in his ' Valdivia ' report.

(3) Oxea ; straight or slightly curved, bluntly pointed, measuring about 1·1 by 0·015 mm.

(4) Oxyasters ; of two kinds—(*a*) large, with 2 to 6 fairly stout, roughened, bluntly pointed rays, total diameter about 0·02 mm. ; these are most abundant just beneath the inhalant chones : (*b*) small, with 6 to 10 thin, very minutely roughened rays ; total diameter 0·014 mm. These are scattered through the choanosome, but not abundantly.

Previously known Distribution. Dirk Hartog, W. Australia (*Lendenfeld*).

Register Nos. and Localities. IV. 8, Wooded Isle ; VI. 18 *c*, Sandy Isle.

16. Ancorina australiensis (*Carter*). (Pl. **25**. fig. 11.)

Stelletta australiensis Carter [1883].
Ecionema australiense Sollas [1888].
Ancorina australiensis Lendenfeld [1903].

There are four specimens in the collection. The largest (R.N. VI. 6 *a* ; Pl. **25**. fig. 11) forms an incomplete cone, 40 mm. in height, with a base measuring 60 by 70 mm. ; the apex is truncated, and over the flattened area thus formed, which measures 40 by 25 mm., are scattered numerous open vents which vary in diameter from 0·25 to 1 mm. Part of the side of the cone is encrusted by *Spongelia dakini* n. sp. The second specimen (R.N. I. 3) is irregularly massive and measures 80 by 60 by 50 mm. ; its upper surface is almost entirely covered by an encrusting *Reniera* and a mass of other débris. The third specimen (R.N. II. 6) measures 40 by 45 by 25 mm., and is largely overgrown by a mass of other organisms. The fourth (R.N. III. 6) an irregular, cake-shaped mass, measures 85 by 50 by 40 mm. ; its upper surface is uneven and slightly wrinkled.

No vents are visible except in the figured specimen ; inhalant pores, visible with a pocket lens, are scattered in groups of two or three over the smooth upper surface of all the specimens ; they are most marked in the figured specimen. Colour in spirit purplish brown on outside, light yellowish brown inside ; texture firm and compact.

The skeleton consists of radially arranged triænes and oxea, with a layer of small ectosomal oxea vertical to the surface. The microrhabds are

thickly scattered through the ectosome and choanosome, as well as forming a well-developed dermal layer. Large brown pigment granules are scattered throughout all four specimens.

The form and size of the spicules agree closely with Sollas's description of Carter's specimen.

Previously known Distribution. Fremantle, West Australia (*Carter*).

Register Nos. and Localities. VI. 6 *a*, Sandy Isle; I. 3, Turtle Bay; II. 6, III. 6, Wooded Isle.

17. Ancorina brevidens n. sp. (Pl. **26**. fig. 9.)

The single specimen, which is about 60 mm. long, 40 mm. wide, and 20 mm. thick, is massive and potato-shaped; at one end is a group of about twenty small, close-set oscula, which average about 1 mm. in diameter. The surface is smooth, a large portion of it being covered with foreign matter of varying kind. Colour in spirit purplish grey; texture hard, compact, slightly compressible.

The ectosome forms a cortex about 0·5 mm. thick, with numerous cortical crypts in its deeper portion; the cortex appears to be only slightly fibrous, but contains numerous brown granular pigment cells, which occur also in the outer portion of the choanosome.

The main skeleton consists of close-packed, radial bundles of oxea and triænes; the cladi of the triænes occur at various levels in and just below the cortex, but chiefly just beneath the surface. The outer part of the cortex contains numerous comparatively small, slender, radially arranged oxea. There is a dense dermal layer of microrhabds, and both microrhabds and tylasters are abundantly scattered through ectosome and choanosome.

Spicules:—(1) Orthotriænes (Pl. **26**. fig. 9 *a*); shaft long, straight or slightly curved, tapering gradually to a fine point (sometimes blunted), measuring about 2·2 by 0·05 mm.; cladi gradually but bluntly pointed, measuring about 0·16 by 0·04 mm.

(2) Anatriænes (Pl. **26**, fig. 9 *b*); shaft very long, slender, tapering very gradually to a finely pointed or blunted extremity, measuring about 3·0 by 0·02 mm.; cladi very much reduced in length, bluntly pointed, measuring about 0·026 by 0·017 mm.

(3) Oxea of two sizes; the larger (Pl. **26**. fig. 9 *c*) fusiform, curved, gradually and sharply pointed, measuring about 2·3 by 0·04 mm.; the smaller (Pl. **26**. fig. 9 *c'*) found only in the cortex, straight, sharp-pointed, measuring about 0·34 by 0·009 mm.

(4) Microrhabds (Pl. **26**. fig. 9 *d*); roughened, slightly swollen in centre, measuring about 0·011 by 0·003 mm.

(5) Tylasters (Pl. **26**. fig. 9 *e*); some have 6 to 8 slender rays with very small heads and no centrum; others, which are slightly smaller, have more rays and a small centrum; the average diameter of the entire spicule is 0·013 mm.

This species is evidently very closely related to *Stelletta truncata* Kieschnick [1898] = *Ancorina amboinensis* Lendenfeld [1903], from Amboina, in the Malay Archipelago, differing in the great abbreviation of the cladi of the triænes, especially of the anatriænes.

Register No. and Locality. VI. 16 *b*, Long Island.

18. Aurora rowi *Dendy* [1916 B].

There are three lobose pieces which have probably been attached to rock; the largest measures 40 mm. in length, 20 mm. in breadth and 15 mm. in thickness; it has a bit of branching coral growing through it. The surface is sub-glabrous and crumpled, with irregular grooves of varying depth running across it. The oscula, which are few in number and single, lie at the apices of small rounded prominences; they vary in size, the largest being 2 mm. in diameter. Inhalant pores are scattered singly over the surface. Colour in spirit chocolate-brown; texture compressible but fairly compact.

The skeleton arrangement and spiculation agree with those of the type specimen, the only difference being the occasional occurrence of irregular branching of the cladi of the orthotriænes; this is not sufficient, however, to justify a specific distinction.

Previously known Distribution. Seychelles (*Dendy*).

Register No. and Locality. II. 8, Wooded Isle.

19. Asteropus simplex [*Carter*].

(For literature and synonymy *vide* Dendy [1916 B].)

The single specimen is an irregular, cake-shaped mass, about 80 mm. in maximum diameter. The upper surface is uneven, somewhat ridged and depressed at intervals; a number of open vents, 1 mm. in diameter, are scattered over it. Colour in spirit purplish brown; texture firm, compact, coarse.

The skeleton arrangement and spiculation agree with those of the 'Sealark' specimen, and need not be described.

Previously known Distribution. Fremantle and Port Phillip Heads, Australia; Hayti (*Carter*); S.W. Australia (*Hentschel*); Indian Ocean (*Dendy*).

Register No. and Locality. VI. 5, Sandy Isle.

20. Erylus proximus *Dendy* [1916 B].

The single specimen, an irregular lobate mass, is 28 mm. in length, 22 mm. in breadth and 15 mm. in thickness. The surface is uneven and punctate, in parts covered with calcareous débris. Scattered singly over an irregular area, near the end where the sponge was probably attached, are many minute, widely open, dermal pores, while over the major portion of the rest of the sponge are numerous white specks, giving the surface its punctate appearance; these are probably closed inhalant pores. On a prominent part of the upper

surface is a single, round, open vent, 1·5 mm. in diameter. Colour in spirit light greyish brown; texture hard and compact.

The arrangement, form and size of the spicules are similar to those of the type specimen.

Previously known Distribution. Cargados, Indian Ocean (*Dendy*).

Register No. and Locality. VI. 12 *a*, Sandy Isle.

21. Donatia robusta (*Bowerbank*).

Tethea robusta Bowerbank [1873].
Tethya globostellata Lendenfeld [1897].
Tethya cliftoni Ridley [1884].
Tethya ingalli Kirkpatrick [1900].
Donatia arabica Topsent [1906].
Donatia japonica var. *albanensis* Hentschel [1909].
Tethya lyncurium Row [1911].
Donatia ingalli Dendy [1916 B].
Donatia globostellata Topsent [1918].
(See M. Burton [1923] MS.)

There are three specimens in the collection, greyish white in colour, ranging from 20 to 26 mm. in diameter. The surface of each is only slightly tessellated.

The skeleton consists of radially arranged bundles of typical strongyloxea which spread out beneath the surface in brushes; loose, radially arranged megascleres lie between the bundles.

Spicules :—(1) Strongyloxea; measuring about 1·62 by 0·028 mm.

(2) Spherasters; these form a dense cortical layer; they have a large centrum and short conical rays; diameter about 0·1 mm.

(3) Small asters; with short rays which may either bear a crown of short spines or be beset with numerous small spines; the total diameter is from 0·012 to 0·016 mm. These are found in the cortex and the choanosome.

(4) Small asters; with long rays which may either end in a sharp point or be spined terminally. These are confined to the choanosome; but there are many intermediate forms scattered through the sponge.

This species is undoubtedly very closely related to *Donatia lyncurium* (Linnæus), from which it differs in the large size of the spherasters and the greater differentiation of the small asters.

Previously known Distribution. Red Sea (*Row, Topsent*); Indian Ocean (*Dendy, Lendenfeld, Ridley, Kirkpatrick*); Australia (*Hentschel*).

Register Nos. and Localities. II. 11, Wooded Isle; VI. 7, VI. 19, Sandy Isle.

22. Donatia multistella (*Lendenfeld*).

Tethya multistella Lendenfeld [1888].
Tethya multistella Hallman [1914].

This species is represented by one small, sub-spherical specimen, greyish white in colour, 12 mm. in diameter; and a fragment of another, pale brown

in colour and apparently about 30 mm. in diameter. The surface of the former is only slightly tessellated, while that of the latter, as far as can be judged, is fairly smooth but uneven. The cortex of both is lacunar and not densely charged with spicules.

The skeleton consists of radially arranged bundles of strongyloxea, which penetrate the cortex and spread out in brushes beneath the surface ; loose radially arranged megascleres are scattered between the bundles.

Spicules :—(1) Strongyloxea of the usual type, measuring about 1·26 by 0·016 mm.

(2) Spherasters ; about 0·06 mm. in diameter, with conical, sharp-pointed rays, nearly as long as the diameter of the centrum.

(3) Small asters of cortex and choanosome ; these range from tylasters, with the ends of the rays beset with small spines, to oxyasters. The diameter of the small aster varies from 0·01 to 0·012 mm.

This species is undoubtedly closely related to *Donatia robusta* (Bowerbank), but differs from it in the size of the spherasters and in small differences in the small asters.

Previously known Distribution. Port Jackson, N.S.W (*Lendenfeld*, *Hallmann*) ; Port Phillip Heads (*Hentschel*).

Register Nos. and Locality. VI. 17 *a*, VII. 1 *f*, Sandy Isle.

23. Chondrilla australiensis *Carter.*

(For literature and synonymy *vide* Dendy [1916 B].)

There are two small specimens in the collection ; one is buff-coloured in spirit, the other liver-brown. The external form and spiculation agree closely with those of the type.

Previously known Distribution. Port Jackson, E. Coast of Australia (*Carter*, *Lendenfeld*) ; Sharks Bay, S.W. Australia (*Hentschel*) ; coast of Cochin China (*Lindgren*) ; Okhamandal, Ceylon, Indian Ocean (*Dendy*).

Register Nos. and Localities. VII. 4 *a*, Turtle Bay ; VIII. 1, Sandy Isle.

24. Reniera aquæductus *O. Schmidt.* (Pl. 25. fig. 12.)

Reniera aquæductus Schmidt [1862].
Reniera aquæductus Kölliker [1864].
Reniera aquæductus Czerniavsky [1878].
Reniera aquæductus Swartschewsky [1905].
Reniera aquæductus Ostroumov [1893].
Reniera aquæductus Babić [1921, 1922].

The single specimen (Pl. 25. fig. 12), which measures 55 mm. in height, is erect, tubular and thin-walled ; at the upper end it divides into two short tubes, each of which terminates in a large round osculum 3 mm. in diameter. Inhalant apertures, visible with a pocket lens, are scattered over the smooth surface. Colour in spirit greyish brown ; texture delicate, spongy, fragile.

The skeleton consists of a somewhat rectangular, unispicular reticulation; towards the outer surface the spicules become concentrated into plurispicular fibres running vertically to the surface.

Spicules:—Oxea; small, smooth, straight or slightly curved, sharply pointed, measuring about 0·23 by 0·008 mm.

Previously known Distribution. Adriatic (*Schmidt*, *Babić*); Black Sea (*Czerniavsky*, *Swartschewsky*).

Register No. and Locality. VII. 3, Abrolhos Islands.

25. Reniera cribricutis *Dendy* [1921 B].

There are two specimens in the collection, one (R.N. VII. 1 *g*), the colour of which is almost white in spirit, agrees very closely in all respects with the type-specimen, except that it is smaller, measuring 25 mm. in length and 10 mm. in diameter, and has only a single vent, 5 mm. in diameter.

The second specimen (R.N. VIII. 2) consists of two fragments, lobate in appearance, each possessing one large, round osculum, about 4 mm. in diameter, with a slightly raised margin, opening out of a wide oscular tube. This specimen, which is light brownish yellow in colour, does not conform so closely to the type, the subdermal cavities being smaller and the primary lines of the skeleton less differentiated. We feel justified, however, in making the identification.

The spicules of the Abrolhos specimens are of much the same size as those of the type, measuring about 0·14 by 0·006 mm.

Previously known Distribution. Amirante, Indian Ocean (*Dendy*).

Register No. and Locality. VII. 1 *g*, VIII. 2, Sandy Isle.

26. Reniera permollis (*Bowerbank*).

Isodictya permollis Bowerbank [1866, 1874, 1882].
Reniera permollis Topsent [1888].
Reniera permollis Dendy [1916 A].

We identify with this species seven specimens of an encrusting nature which vary considerably in size and general appearance. The surface is slightly hispid, and the large subdermal cavities can be seen through the thin dermal membrane, which is almost aspiculous. The oscula are small, single and scattered, measuring up to about 3 mm. in diameter. The colour in spirit varies from light yellowish brown to nut-brown; texture in most cases very soft and friable, that of R.N. VI. 17 *d* and R.N. VI. 17 *e* firm and compact.

The skeleton arrangement and spiculation agree closely with those of specimens from Okhamandal, but the tendency to form primary lines is not so strongly marked.

Previously known Distribution. European seas (*Bowerbank*, *Topsent*); Okhamandal, Indian Ocean (*Dendy*).

Register Nos., Localities, etc. VI. 17 *d*, VI. 17 *e*, Sandy Isle; II. 7 *b*, III. 11, IV. 6, IV. 7, IV. 10, Wooded Isle.

Reniera spp.

There are also in the collection a number of more or less fragmentary specimens representing other species of this difficult genus.

Register Nos., Localities, etc. I. 3, VII. 4 *b*, Turtle Bay; VI. 14, VI. 15 *b*, Sandy Isle.

27. Petrosia dura (*Nardo*) *Vosmaer* [1887].

Reniera dura Nardo.
Reniera? dura Nardo, Schmidt [1862].
Schmidtia dura Balsamo Crivelli [1863].
Schmidtia dura Schmidt [1868].
Petrosia dura Topsent [1897].
Petrosia dura Ferrar [1914].
Petrosia dura Babić [1921, 1922].

The single specimen in the collection consists of a somewhat irregularly shaped, digitiform fragment, 40 mm. long and 10 mm. thick, which had probably been growing erect and has evidently been cut off transversely from a larger sponge. The surface is smooth, and the dermal membrane, which is thin but distinct, is pierced by inhalant pores visible with a lens. There are two round oscula, 2 mm. in diameter. Colour in spirit light reddish brown; texture hard but brittle.

The skeleton arrangement and spiculation agree closely with those of one of Schmidt's specimens in the British Museum.

The spicules are oxea, which show a great tendency to become rounded off at one or both ends; they measure about 0·35 by 0·015 mm.

Previously known Distribution. Adriatic (*Schmidt, Babić*); Mediterranean (*Balsamo Crivelli, Topsent*); Cantabrico (*Ferrar*).

Register No. and Locality. VI. 16 *a*, Long Island.

28. Halichondria phakellioides n. sp. (Pl. 26. fig. 10.)

The single specimen consists of a portion of an erect lamella, 190 mm. in height, 75 mm. in width, with a maximum thickness of 8 mm., constricted towards the base of attachment so as to form a very short, thick stalk. The lamella, which has a narrow, very slightly sinuous margin, appears similar on both surfaces, but one has been somewhat cracked and rubbed.

The surface is smooth and practically even, covered everywhere by a very thin, transparent dermal membrane (rubbed off in places), which contains numerous irregularly and loosely scattered tangential oxea. The dermal membrane is dotted with numerous small, round pore-areas, the pores themselves apparently being closed. The oscula are very inconspicuous; they may be represented by minute apertures at the apices of several small

prominences which are sparsely scattered over both surfaces of the sponge. The colour in spirit is light brownish yellow; texture tough, flexible, resilient.

The skeleton consists of loose tracts of spicular fibre running longitudinally and confined to the middle of the lamella; at right angles to these on both sides still looser and less well-defined fibres run outwards towards the surface, where they terminate in loose brushes of spicules, which help to support the dermal membrane.

Numerous loose spicules lie scattered everywhere between the fibres. There is a fair quantity of spongin present, but so pale in colour that it is almost invisible in unstained preparations.

Spicules:—Oxea (Pl. 26. fig. 10 *a*); usually slightly curved or angulated and tapering somewhat abruptly at each end to a sharp point; measuring about 0·58 by 0·017 mm. when fully grown, but frequently shorter and especially more slender. These spicules occasionally become stylote, with one end broadly rounded off (Pl. 26. fig. 10 *b*).

Halichondria phakellioides seems to come very near to *Halichondria velamentosa* (Hansen) Lundbeck [1902], a remarkable fact considering that the former is a shallow-water, sub-tropical form, while the latter is found in deep water in the Arctic regions.

Register No. and Locality. VI. 1, Sandy Isle.

29. Chalina palmata (*Lamarck*).

Spongia palmata Lamarck [1913].
Chalina palmata Ridley & Dendy [1887].
Cladochalina euplax Lendenfeld [1887].
Chalina palmata Whitelegge [1901].
? *Ceraochalina retiarmata* Dendy [1905].

There are three small, incomplete specimens in the collection. The sponge is of erect habit, and consists of irregular, digitate processes arising from a narrow base and sometimes branching. The surface is fairly even, slightly hispid, and has a distinctly reticulate appearance. The thin, transparent dermal membrane is pierced by numerous round inhalant pores, which vary considerably in size. The small, round oscula measure up to 2 mm. in diameter, and are for the most part arranged uniserially on the margins. Colour in spirit light brown: texture spongy, tough and fibrous.

The skeleton arrangement agrees closely with that of *Chalina palmata* Ridley and Dendy [1887], except that the dermal reticulation of spicular fibre has a somewhat smaller mesh.

Spicules:—Oxea; short, slightly curved, gradually sharp-pointed, measuring about 0·07 by 0·004 mm., but often more slender.

After re-examining the type slides of *Ceraochalina retiarmata* Dendy [1905], we think this species may also be identical with *Chalina palmata* (Lamarck).

Previously known Distribution. Indian and European Seas (*Lamarck*); Torres Strait (*Challenger*); New South Wales (*Lendenfeld*, *Whitelegge*).

Register Nos. and Locality. II. 3, II. 14, II. 17, Wooded Isle.

Chalina sp.

The single specimen, which measures 40 mm. in height and has an average diameter of 10 mm., is erect, shortly digitiform, slightly compressed, with a single round osculum, 3 mm. in diameter, at the apex, to which two long oscular tubes converge. Surface smooth, minutely punctate; inhalant pores close-set, about 0·04 mm. in diameter. Texture firm, compact, resilient. The specimen is almost black on the outside and brown inside, owing to the presence of numerous pigment granules.

The skeleton is very regular; a transverse section shows numerous parallel primary fibres, about 0·06 mm. in diameter, containing a core of well-developed spicules, usually arranged multiserially and surrounded by a thick coating of spongin. The primary fibres are connected crosswise at very frequent intervals by secondary fibres of less than one spicule's length and usually with only a single spicule in the axis. A few loose spicules are scattered between the fibres. The spicules at the ends of the primary fibres pierce the dermal membrane, which is also supported by a close-meshed network of unispicular fibre.

Spicules:—Oxea; fusiform, slightly curved, gradually sharp-pointed, measuring about 0·14 by 0·007 mm.

Register No. and Locality. III. 1, Wooded Isle.

Pachychalina sp. ?

There is a small, delicate fragment, light brown in colour, which evidently belongs to this genus.

Register No. and Locality. II. 10, Wooded Isle.

30. Ceraochalina multiformis *Lendenfeld* var. manaarensis *Dendy*.

(For literature and synonymy *vide* Dendy [1905].)

We identify with this variety four pieces which have apparently formed part of an erect, flattened, lamellar specimen, with an irregularly undulating and proliferating surface. The largest piece is 83 mm. high and 55 mm. wide, and the thickness of the lamella is about 6 mm. The surface is glabrous, and the thin dermal membrane is pierced by numerous inhalant pores. The oscula, which measure about 2 mm. in diameter, are fairly numerous and scattered, but confined almost entirely to one surface of the lamella, while some are marginal in arrangement. The colour in spirit is dirty greyish violet; texture firm, rather tough and resilient.

The skeleton arrangement and spiculation agree very closely with those of the type of the variety, so no description is necessary.

Previously known Distribution (of variety). Gulf of Manaar and Ceylon (*Dendy*).

Register No. and Locality. I. 2, Turtle Bay.

31. Phlœodictyon abrolhosensis n. sp. (Pl. 26. fig. 11.)

The single specimen, which is about 45 mm. long, 35 mm. wide and 12 mm. thick, is somewhat flattened, cake-shaped, and has probably been attached to a rock by its slightly concave under surface. The smooth, convex upper surface gives off numerous very thin-walled fistulæ of varying sizes, the largest being about 15 mm. in length. The diameter of the fistulæ is from 3 to 5 mm. ; some of the smaller ones end blindly ; these either bear inhalant pores or are young stages of the larger ones, which terminate each in a wide vent. The body generally is covered with a thin rind (dermal membrane), which easily peels off. Colour in spirit greyish brown ; texture internally very soft and spongy, distinctly fibro-reticulate.

The skeleton of the interior consists of a loose, irregular, wide-meshed network of multispicular fibre, averaging about 0·065 mm. in diameter. The fibres are compact, the spicules being surrounded by a good quantity of pale-coloured spongin. Numerous loose spicules, mostly arranged in small bundles of one spicule's length, are scattered through the soft ground substance, which also contains many small brown pigment granules. Immediately beneath the surface and parallel with it is an irregular reticulation of similar spicular fibre, which tends to separate from the underlying main skeleton and come away with the dermal membrane when the latter is peeled off. The skeleton of the dermal membrane and that of the walls of the fistulæ consists of a very dense feltwork of single spicules lying tangentially in approximately a single layer.

Spicules :—Oxea (Pl. 26. fig. 11) ; slightly curved, sharply and fairly gradually pointed at each end, sometimes hastate, measuring about 0·22 by 0·006 mm.

This species seems to approach *Phlœodictyon seychellense* Dendy [1921 B] most closely.

Register No. and Locality. II. 9, Wooded Isle.

Phlœodictyon sp.

There are two small fistulæ, light brown in colour, which have evidently been broken off from the surface of a *Phlœodictyon*.

Register No. and Locality. VI. 12 *c*, Sandy Isle.

32. Pseudoesperia carteri n. sp. (Pl. 26. fig. 12.)

Sponge lobose, elongated (probably horizontally), slightly compressed, with corrugated surface. Vents and pores not seen. The dermal membrane is distinct and thick, overlying the cavernous and coarsely fibrous interior. Colour in spirit brown ; texture soft and compressible.

The main skeleton consists of a well-developed, coarse reticulation of stout, compact, multispicular fibre up to about 0·2 mm. in diameter, composed of closely packed megascleres with little or no spongin. The meshes of the reticulation vary much in size, 0·8 mm. being an average diameter. There is a loose dermal reticulation of ill-defined spicular fibre and loose spicules, with more or less dense, radially arranged brushes of slender tylostyles.

Spicules:—(1) Tylostyli (Pl. 26. fig. 12 *a*); often slightly curved or crooked, with a well-developed oval head separated from the fairly stout shaft by a slight constriction; fairly gradually sharp-pointed at the apex; size about 0·28 by 0·008 mm.

(2) Sigmata (Pl. 26. fig. 12 *b*); slender, simple and contort, with short, abruptly recurved, sharply-pointed ends. Length about 0·04 mm. from bend to bend.

(3) Large quadridentate anisochelæ (Pl. 26. fig. 12 *c*–*c''*); very numerous, mostly in rosettes, but scattered singly as well. The free end is composed of four short, sharply-pointed teeth which extend more or less at right angles to the shaft, which is markedly curved and fairly stout; the fixed end is quadrilateral in side view, with the three teeth almost parallel to one another; the median tooth connected with the shaft by a long, narrow falx. The total length of the spicule is about 0·04 mm. and the shaft is about 0·004 mm. in diameter.

(4) Small, semi-bipocillate anisochelæ (Pl. 26. fig. 12 *d*); mostly in rosettes; measuring about 0·01 mm. in length; the free end of the markedly curved shaft is expanded into a flat, saucer-shaped fimbria; in front view this appears as a narrow, slightly curved cross beam at the outer end of the shaft; the fixed end is quadrilateral and of the chelate type. This form of microsclere is probably intermediate between an anisochela and a bipocillate.

(5) Small, palmate anisochelæ of the Iophon type (Pl. 26. fig. 12 *e*); with only a very minute spur at the small end; these occur scattered singly and are not so abundant as the other microscleres; length about 0·017 mm.

This sponge appears to be almost identical with *Pseudoesperia enigmatica* (olim *Esperia parasitica* Carter [1880]) except for the absence of sandy fibre so characteristic of Carter's specimens. We have examined a microscopic preparation of Carter's type-specimen (?) in the British Museum collection, and find that the small, semi-bipocillate anisochelæ are certainly present, though not mentioned in his description.

Register No. and Locality. II. 15, Wooded Isle.

33. Pseudoesperia trichophora n. sp.

The single specimen consists of a small, light-brown fragment encrusting a *Hircinia* sp.?

The main skeleton consists of a reticulation of stout, ill-defined spicular fibre with many loose megascleres scattered irregularly; radially arranged brushes of tylostyles lie vertically to the surface.

The spiculation agrees closely with that of *Pseudoesperia carteri*, except that the sigmata are entirely replaced by trichodragmata.

Spicules :—(1) Tylostyli ; size about 0·34 by 0·006 mm.

(2) Large, quadridentate anisochelæ ; about 0·056 mm. in length.

(3) Small, semi-bipocillate anisochelæ, about 0·01 mm. in length.

(4) Small, palmate anisochelæ, about 0·012 mm. in length.

(5) Trichodragmata ; short, compact bundles, measuring about 0·026 by 0·006 mm.

It is an interesting fact that this species differs from *Pseudoesperia carteri* only in the replacement of the sigmata of the former by trichodragmata. These spicules are so widely and sosporadically distributed throughout the tetraxonid sponges that it is extremely difficult to estimate their taxonomic value.

The peculiar form of the quadridentate anisochelæ and the occurrence of what we have called the " semi-bipocillates " seem to justify the retention of Carter's genus *Pseudoesperia*.

Register No. and Locality. II. 12 *a*, Wooded Isle.

34. Esperella plumosa (*Carter*).

(For literature and synonymy *vide* Dendy [1916 A].)

The material consists of a small, whitish-yellow fragment encrusting *Hippospongia intestinalis* (Lamarck). No further description is necessary.

Previously known Distribution. Mauritius and Mergui Archipelago (*Carter*); Ceylon, Okhamandal (*Dendy*).

Register No. and Locality. VI. 13 *b*, Sandy Isle.

35. Biemna tubulata *Dendy*.

Desmacella tubulata Dendy [1905, 1916 A].
Biemna microxa Hentschel [1911].
Toxemna tubulata Hallmann [1917].
Biemna tubulata Dendy [1921 B].

The material consists of a couple of fragments of thin-walled tubes, the outer surface of which appears slightly granular, while the inner bears numerous minute openings of exhalant canals. Colour in spirit brownish yellow ; texture very soft and fragile.

The skeleton arrangement and spiculation agree very closely with those of previously described specimens.

We consider *Biemna microxa* Hentschel [1911] to be identical with this species.

Previously known Distribution. Gulf of Manaar, Okhamandal, Indian Ocean (*Dendy*) ; S.W. Australia (*Hentschel*).

Register No. and Locality. VIII. 3, Sandy Isle.

36. ECHINODICTYUM BILAMELLATUM (*Lamarck*) *Ridley*.

Spongia bilamellata Lamarck [1813].
Echinodictyum bilamellatum Ridley [1881].
Echinonema vasiplicata Carter [1882 B].
Kalykenteron elegans Lendenfeld [1888].
Kalykenteron silex Lendenfeld [1888].
Thalassodendron typica Whitelegge [1901].
Echinodictyum bilamellatum Hentschel [1911].
Echinodictyum elegans Hallman [1912].

There is in the collection one beautiful, cup-shaped specimen, 110 mm. in height, with a short stalk and very slightly folded walls. The colour in spirit of the inner surface is almost black, that of the outside grey merging to violet.

The skeleton arrangement and spiculation agree very closely with those of the specimens described by Ridley and Hentschel.

We have also examined two dry specimens of this species from the Dampier Archipelago, N.W. Australia, which are in Professor Dendy's collection at King's College, London. These are both cup-shaped with much folded walls.

Previously known Distribution. N.W. and W. Australia (*Ridley*) ; Fremantle, S.W. Australia (*Carter*) ; S.W. Australia (*Hentschel*) ; E. and W. Australia (*Lendenfeld*) ; E. Australia (*Whitelegge, Hallmann*).

Register No. and Locality. V., Albrolhos Islands.

37. ANCHINOË FICTITIOIDES n. sp. (Pl. 25. fig. 13 ; Pl. 26. fig. 13.)

There are two specimens in the collection, each forming an almost continuous, vertical, fan-shaped lamella, with an irregularly indented upper margin. The larger specimen (R.N. VI. 4, Pl. 25. fig. 13), which measures 150 mm. in greatest height, 95 mm. in greatest width, and has an average thickness of 7 mm., has two conspicuous oval fenestræ ; the other specimen has only one fenestra. The width of both specimens diminishes gradually below to a narrow base of attachment. The colour of the larger specimen in spirit is pale greyish yellow, that of the smaller light brown ; texture fibrous, tough and resilient. The surface is glabrous.

On both surfaces numerous circular, slightly raised, pustule-like, cribriform pore-areas are closely but irregularly scattered. The larger of these pore-areas measure 3 or 4 mm. in diameter ; they vary, however, in size, number, and conspicuousness in different parts of the same specimen.

A few small, marginal vents are seen in both specimens. A ramifying and anastomosing system of inhalant and exhalant subdermal canals can be seen through the thin dermal membrane.

In the deeper parts of the sponge the main skeleton consists of an irregular network of horny fibre cored to a varying extent by smooth megascleres (tornotoxea) and echinated by acanthostyli. Dense fibres, consisting only of tornotoxea, ascend somewhat irregularly towards the surface, and the radially arranged terminal spicules of these fibres form a fringe round

the pore-areas. The sieve-membrane of these areas is free from spicules, except for numerous isochelæ.

Spicules:—(1) Tornotoxea (Pl. **26**. fig. 13 *a*); smooth, slender, usually straight; ends hastate but unequal; size about 0·4 by 0·006 mm.

(2) Acanthostyli of two kinds—(*a*) (Pl. **26**. fig. 13 *b*) with short, straight or sometimes slightly curved shaft, which is slightly swollen at one end and sharply pointed at the other, covered with small, slightly recurved spines; size about 0·14 by 0·013 mm.: (*b*) (Pl. **26**, fig. 13 *c*) with long, slightly curved shaft, the curve being most noticeable just above the slightly swollen base; the spines are very small and only extend for about two-thirds of the shaft from the base, thus leaving the sharply-pointed apical end quite smooth. These longer acanthostyles, which measure about 0·35 by 0·01 mm., are found only in the larger specimen (R.N. VI. 4).

(3) Tridentate isochelæ (chelæ arcuatæ) (Pl. **26**. fig. 13 *d*), with stout, slightly curved shaft and short teeth; measuring about 0·024 mm. in length. These spicules are very abundant in the dermal membrane, especially in the pore-areas, but occur also scattered through the choanosome.

This species agrees very closely with the European *Anchinoë fictitius* (Bowerbank) J. Stephens [1921] as regards its pore-areas and spiculation, but differs widely in its mode of growth, which closely resembles that of *Yvesia* (*Grayella*) *spinulata* Hentschel [1911], also a S.W. Australian and Indian Ocean species (*vide* Dendy [1921 A]). Indeed, *Yvesia spinulata* differs from *Anchinoë fictitioides* in little if anything more than the replacement of the acanthostyles by acanthoxea, and may probably be regarded as a direct derivative of the latter species.

Register Nos. and Locality. VI. 4, VI. 11, Sandy Isle.

38. Dendoricella schmidti (*Ridley*).

Crella schmidti Ridley [1884].
Damiria australiensis Dendy [1896].
Damiria Schmidti Topsent [1897].
Damiria australiensis Lindgren [1897, 1898].
Dendoricella Schmidti Hentschel [1911, 1912 A].

The larger of the two specimens (R.N. IV. 9) in the collection consists of five erect, digitiform processes springing from a thin, common base; the processes measure about 8 mm. in diameter, and four of them divide at their ends into a varying number of slender, secondary, digitiform processes. The second specimen (R.N. III. 10) consists of a portion of a single lobe, dividing above into four slender, digitiform processes. The general surface of the sponge is covered with narrow, meandering ridges running longitudinally; the dermal membrane, which is smooth and transparent, is interrupted by small pore-sieves, visible with a lens. A number of small oval vents, sometimes lying in slight depressions, are scattered singly on the processes. Colour in spirit light greyish brown; texture very soft, spongy, friable.

The skeleton arrangement and spiculation agree with those of previously described specimens.

Spicules:—(1) Oxea; measuring about 0·23 by 0·01 mm.

(2) Amphitylota; some straight, others slightly undulating, measuring about 0·31 by 0·007 mm.

(3) C-shaped sigmata of two sizes, the larger measuring about 0·039 by 0·0028 mm., the smaller 0·02 by 0·0014 mm.

(4) Tridentate isochelæ (chelæ arcuatæ) of two sizes, the larger being about 0·034 mm. and the smaller about 0·022 mm. in length.

Previously known Distribution. Port Jackson (*Ridley*); Port Phillip Heads (*Dendy*); Amboina (*Topsent*); S.W. Australia (*Hentschel*).

Register Nos. and Locality. III. 10, IV. 9, Wooded Isle.

39. Trachycladus lævispirulifer *Carter.*

Trachycladus lævispirulifer Carter [1879, 1885–6].
Trachycladus lævispirulifer Dendy [1897].

(For further possible synonymy see Hallmann's species [1916].)

The external form of the single specimen resembles closely that of *Trachycladus digitatus* var. *clavatus* Hallmann [1916]. The branches, which anastomose freely, are subcylindrical, and their surface appears minutely conulose owing to the up-pushing of the dermal membrane by the ends of the impinging skeleton fibres. The inhalant pores are scattered singly, closely and for the most part equidistantly over the entire surface, giving it a minutely reticulate appearance. The small oscula are scattered sparsely and irregularly. Colour in spirit whitish brown; texture tough and dense.

The skeleton arrangement calls for no comment.

Spicules:—(1) Oxea; smooth, curved, of nearly uniform diameter throughout their length, bluntly pointed, measuring about 0·47 by 0·016 mm.; very rarely stylote.

(2) Spinispiræ; minutely spined, corkscrew spicules, usually of two complete turns, measuring about 0·0135 mm. in length; very abundant. Simpler forms, C- and S-shaped, are found frequently.

(3) Microstrongyla; of two kinds—(*a*) slender, centrotylote, 0·019 mm. long; (*b*) stout, rarely centrotylote, 0·016 by 0·003 mm. These microscleres are rare.

We have examined preparations of this species in Mr. Carter's own cabinet, and feel justified in identifying with it the Abrolhos specimen, although the oxea of the latter are larger and the microstrongyla less abundant.

Hallmann [1916] has endeavoured to distinguish between a number of Australian species, some of which he describes as new. We are inclined to think, however, that the differences between Hallmann's specimens are not sufficiently great to justify specific distinction being made, and that probably

all the known Australian specimens of *Trachycladus*, as well as Lendenfeld's *Spirophora digitata* and *Spirophora bacterium*, should be included in *Trachycladus lævispirulifer* Carter.

Previously known Distribution. South-West Australia (*Carter*); Port Phillip Heads, Australia (*Dendy*).

Register No. and Locality. III. 9, Wooded Isle.

40. Sigmosceptrella fibrosa *Dendy*. (Pl. 25. fig. 14.)

Spirastrella fibrosa Dendy [1897].
Sigmosceptrella fibrosa Dendy [1921 A].

The single fine specimen in the collection, which measures 70 mm. in height, is sessile and lobodigitate. Surface sub-glabrous, almost smooth in parts, slightly conulose or nodular in others. The close-set inhalant pore-areas give the surface a minutely reticulate appearance. They overlie large, funnel-shaped chones in the cortex, which is slightly fibrous and measures up to 0·4 mm. in thickness. The roof of each chone is not merely a dermal membrane, but is moderately thick, strengthened by microscleres (sigmodiscorhabds), and pierced by individual pores which take the form of short canals. The lower part of the chone is constricted to a relatively small opening, which leads into a spacious subcortical crypt; from this, inhalant canals, provided with diaphragms along their length, penetrate the choanosome. The canal system is eurypylous, the flagellate chambers spherical and measuring up to 0·05 mm. in diameter. The larger exhalant canals and the wide oscular tubes are surrounded by a thick layer of gelatinous mesogloea. Vents small but prominent, scattered singly on the upper margin of the sponge, sometimes at the ends of small conical projections. Each vent is much smaller than the diameter of the oscular tube out of which it opens, so that the latter appears to have a thin roof with the vent in the middle. Colour in spirit yellowish white; texture firm, compact, resilient.

The skeleton arrangement agrees closely with Dendy's original description. Between the chones the cortex is packed with microscleres, intermingled in places with the ends of the radial bundles of megascleres.

Spicules:—(1) Styli; straight, evenly rounded or slightly enlarged at the base and sharply pointed at the apex, very uniform in shape and size, measuring about 0·34 by 0·01 mm.

(2) Isodiscorhabds (sigmodiscorhabds); measuring in total length about 0·05 mm.; the diameter of the smooth shaft is about 0·008 mm., that of a whorl with the spines included 0·025 mm. The development and adult form of these spicules have been described and figured by Dendy in "The Tetraxonid Sponge Spicule—A Study in Evolution" [1921 A].

Previously known Distribution. Port Phillip Heads (*Dendy*).

Register No. and Locality. VI. 2, Sandy Isle.

41. Spirastrella vagabunda *Ridley.*

Spirastrella vagabunda Ridley [1884].

(For literature and possible synonymy *vide* Dendy [1905] and Vosmaer [1911].)

The larger of the two specimens, which measures about 60 by 20 by 25 mm., is elongated and tubular, with a hollow digitiform process (which has been cut off) arising from one end. Two large, irregularly shaped vents are present, and inhalant pore-sieves are visible over a small portion of the smooth but uneven surface. The second specimen is a small tubular fragment with thick walls. Colour in spirit light brown ; texture firm and compact.

The skeleton arrangement and spiculation agree closely with those of the type.

The Abrolhos specimens come very close to *Spirastrella vagabunda* var. *tubulodigitata* Dendy [1905], but the tylostyles of the former are shorter and stouter.

Previously known Distribution. Torres Straits (*Ridley*) ; Indian Ocean (*Dendy*).

Register Nos. and Locality. VI. 10, VI. 15 *a*, Sandy Isle.

42. Aaptos aaptos (*Schmidt*).

Ancorina aaptos O. Schmidt [1864].
Aaptos adriatica Gray [1867].
Ancorina aaptos O. Schmidt [1868].
Trachya pernucleata Carter [1870].
Tuberella tethyoides Keller [1880].
Tethyophæna silifica O. Schmidt [1880].
Tuberella tethyoides Vosmaer [1887].
Aaptos adriatica Vosmaer [1887].
Amorphina Duchassaingi Topsent [1889].
Suberites spissus Topsent [1892].
Tuberella Duchassaingi Topsent [1894].
Tuberella tethyoides Topsent [1896].
Suberites aaptus Lendenfeld [1896].
Suberites aaptus Topsent [1898].
Tuberella aaptos Topsent [1898, 1900].
Tuberella aaptos Wilson [1902].
Tuberella aaptos Hentschel [1909, 1912].
Tuberella aaptos Dendy [1916 A].
Tuberella aaptos Babić [1922].

The larger of the two specimens (R.N. III. 5) is irregularly subspherical, measuring 45 by 25 by 30 mm. ; at one end, in a slight depression, lies a small group of oscula, and three or four small round oscula are scattered singly over the sub-glabrous upper surface. Colour in spirit dark brown outside, light brown inside ; texture compact but compressible.

The other specimen (R.N. VI. 12 *b*) is a small, light-brown fragment 25 mm. in length, 15 mm. in breadth, and 8 mm. in thickness, with a flat, sub-glabrous upper surface, in the centre of which is a single slit-like

osculum raised on a small papilla. Pigment granules are present in the large specimen, absent in the small one.

The skeleton arrangement and spiculation agree closely with the descriptions given by Topsent and Wilson.

We propose to revive here Gray's generic name *Aaptos* [1867], because we can find no adequate reason why Keller's genus *Tuberella* [1880] should stand in place of it, though we regard his species *Tuberella tethyoides* as synonymous with *Ancorina aaptos* Schmidt. We have revised and brought up to date Topsent's synonymy list, which we think can be definitely accepted.

Carter [1870] described a new genus and species of sponge under the name *Trachya pernucleata*; after examining his preparations we think it justifiable to identify this species with *Aaptos aaptos* (Schmidt), and it is therefore included in the synonymy list.

Carter [1882 A, 1886] described two more species of *Trachya*, viz. *Trachya durissima* and *Trachya horrida*; these are probably identical with his original species, *Trachya pernucleata*.

Trachya globosa Carter [1885–86] and *Trachya globosa* var. *rugosa* Carter [1886] are obviously lipotriænose Tetillids, having exceedingly long, slender oxea for megascleres and sigmata for microscleres.

Carter [1876, 1882 A] proposed a group Polymastina in the Sub-order Suberitida to include his genus *Trachya* as well as the typical *Polymastia*, referring to *Trachya pernucleata* and its allies as "*Geodia*-like forms of *Polymastia*."

Although Vosmaer, Topsent and Wilson have placed the genus *Tuberella* (= *Aaptos*) in the Tethyidæ (Donatiidæ), we are inclined to agree more with Carter's views; and so, because of the arrangement of the skeleton, the absence of any fibrous cortex and the presence of pin-head spicules in some cases, we now propose to transfer it to the Sigmatotetraxonida, Family Clavulidæ, Sub-family Suberitinæ.

Previously known Distribution. Mediterranean (*Schmidt, Lendenfeld, Topsent*); Gulf of Naples (*Keller*); Gulf of Mexico (*Topsent*); Porto Rico (*Wilson*); S.W. Australia (*Hentschel*); Aru Islands (*Hentschel*); Okhamandal (*Dendy*).

Register Nos. and Locality. III. 5, Wooded Isle; VI. 12 *b*, Sandy Isle.

43. Polymastia mammillaris (*O. F. Müller*) *Bowerbank*.

(For literature and synonymy *vide* Topsent [1900].)

There is a single small specimen, consisting of about six smooth, slender, thin-walled, hollow, mammiform projections, 10 to 15 mm. in length, rising from a plate-like base which has either been torn off a stone or from a larger specimen; the surface of the base is slightly hispid. The colour in spirit is dull brown owing to the development of pigment granules.

The skeleton arrangement and spiculation agree with the descriptions given by Bowerbank and Topsent.

Spicules:—(1) Small tylostyles; size about 0·17 by 0·008 mm.

(2) Large tylostyles; size about 1·1 by 0·02 mm.; the size of the head varies greatly.

Previously known Distribution. Cosmopolitan.

Register No. and Locality. VI. 12 *d*, Sandy Isle.

44. Megalopastas arenifibrosa n. sp. (Pl. 25. fig. 15.)

There are three specimens of this sponge in the collection. The largest (R.N. VI. 3, Pl. 25. fig. 15), which must be regarded as the type of the species, is sessile, erect, and consists of a principal lamella giving off a number of secondary lamellæ of varing size. The specimen is 110 mm. high and 70 mm. wide, and the thickness of the lamella is about 3 mm. The second specimen (R.N. VI. 9), which is 65 mm. high, 15 mm. wide and about 5 mm. thick, is a fragment probably broken off the type. The third specimen (R.N. IV. 4) is small and lamino-clathrous, becoming constricted towards the base of attachment. The total height is about 50 mm., the maximum breadth about 55 mm., and the average thickness of the lamella about 4 mm. The surface appears granulated, the granules being really numerous, minute, close-set conuli. The vents are small, round and single; some are arranged marginally, others are scattered, but almost always confined to one surface of each lamella. Colour in spirit dark brown, becoming lighter towards the base of the sponge; texture compressible, resilient, fairly tough.

The main skeleton consists of primary fibres, about 0·09 mm. in diameter, running vertically to the surface and connected by an irregular network of secondary fibres about half the diameter of the primaries; the outermost of the secondary fibres form a distinct subdermal skeleton network, the fibres averaging about 0·03 mm. in diameter. The fibres are laminated and "pithed" and the primary fibres are cored by numerous sand-grains and broken spicules.

The dermal membrane, which sometimes contains a good many broken spicules, is pierced by round inhalant pores, about 0·06 mm. in diameter, which lead into large subdermal cavities lying in the ectosome, which contains numerous close-packed, granular, stellate cells. The canal-system is lacunar; the flagellate chambers, which are large, sac-shaped, averaging about 0·05 mm. in diameter, are placed fairly close together and are eurypylous. The mesoglœa of the choanosome is not strongly developed, except around some of the larger canals, where it is collenchymatous, with stellate cells. There are also numerous bands of fibrous tissue, composed of granular, elongated cells, running in from the ectosome in places and deeply penetrating the choanosome.

This species is well characterised by its external appearance and unusually

compact texture, and, above all, by the coring of the primary fibres by sand-grains, which indicates an approach to the Family Spongeliidæ.

Register Nos. and Localities. VI. 3, VI. 9, Sandy Isle ; IV. 4, Wooded Isle.

45. Spongelia dakini n. sp. (Pl. 25. fig. 11.)

This most interesting specimen forms a very smooth encrustation (about 0·65 mm. thick), almost white in colour, over a considerable portion of the surface of a very fine specimen of *Ancorina australiensis* (Pl. 25. fig. 11).

There is a well-developed, minutely reticulate cortex, about 0·085 mm. thick, formed of sand and broken spicules, which gives the surface a very uniform appearance and presumably covers the vents, as these are not visible.

The main skeleton consists of columns of broken foreign spicules of various kinds, but without visible spongin ; the columns run vertically and sometimes appear to branch slightly as they approach the surface.

The thin, transparent dermal membrane is pierced by numerous round inhalant pores, which measure up to 0·05 mm. in diameter ; usually there is only a single pore in each mesh of the cortex. Small subdermal cavities in the sand cortex lead into large subcortical crypts or inhalant canals in the choanosome, the mesoglœa of which is but feebly developed. The flagellate chambers are crowded together, sac-shaped, measuring about 0·06 mm. in diameter ; they are eurypylous and each has several prosopyles. Some of the larger canals appear to be surrounded by fibrous tissue ; these are probably exhalant.

This species is at once distinguished by its thin, encrusting habit and its well-developed, reticulate sand cortex.

Register No. and Locality. VI. 6 *b*, Sandy Isle.

46. Psammopemma crassum (*Carter*) var.

Holopsamma crassa Carter [1885-6].
Psammopemma crassum Lendenfeld [1889].

The single specimen, which is 35 mm. in height, 20 mm. in width, and about 5 mm. in thickness, is erect, somewhat lamellar in shape, thickening considerably towards the base of attachment. The surface is uneven and sometimes rugose. Oscula are not visible. Colour in spirit light greyish brown ; texture hard, gritty, incompressible, but friable.

There is a thin, pore-bearing dermal membrane, overlying large subdermal cavities in the ectosome, which is feebly developed, with collenchymatous mesoglœa. The canal-system is lacunar ; the chambers, which have several prosopyles, are large, sac-shaped, measuring about 0·1 mm. in longer diameter, and eurypylous. The gelatinous mesoglœa is fairly conspicuous ; it contains stellate cells and also bands of fibrous tissue.

The skeleton consists of a dense mass of sand-grains and broken spicules with no recognisable spongin, interrupted by irregular patches of soft tissue more or less free from sand.

The large size of the flagellate chambers, and the highly lacunar character of the canal-system generally, indicate that this sponge is a true Spongeliid and not a reduced Tetraxonid that has lost its proper spicules.

Previously known Distribution. Port Phillip Heads (*Carter*, *Lendenfeld*); Port Jackson (*Lendenfeld*).

Register No. and Locality. IV. 11, Wooded Isle.

47. Hippospongia intestinalis (*Lamarck*).

(For literature and synonymy *vide* Dendy [1905].)

There are two specimens in the collection, light brown in colour, of elongated tubular form, with their walls perforated at irregular intervals and the surface slightly conulose. The tubes are about 12 mm. in diameter.

The main skeleton is composed of an irregular network of fairly stout, amber-coloured, horny fibre, the fibres measuring up to 0·08 mm. in diameter. There is a surface reticulation of more slender horny fibre. A certain amount of foreign matter, including a few huge oxeote spicules, has been incorporated within the sponge.

Previously known Distribution. Mediterranean (*Lamarck*); Zanzibar (*Hyatt*); Mascarene Islands and Amirante Group (*Ridley*); Ceylon Seas (*Dendy*).

Register Nos. and Locality. VI. 13 *a*, VII. 2, Sandy Isle.

48. Coscinoderma pyriforme *Lendenfeld* var. *a*.

Coscinoderma pyriforme Lendenfeld [1889].

There are four specimens in the collection. The largest (R.N. III. 7), which must be regarded as the type of the variety, is erect, massive, somewhat compressed laterally, and has evidently been attached to a rock along its base and a portion of one side; the total height is 50 mm., the maximum breadth 65 mm., and the average thickness 25 mm. A number of sphinctrate oscula, about 3 mm. in diameter, are arranged along a crest on the upper surface. The second specimen (R.N. II. 7 *a*), which measures 45 mm. long, 35 mm. wide, and has an average thickness of 12 mm., is oval and somewhat cushion-shaped; a number of round sphinctrate oscula, the largest of which measures 2 mm. in diameter, lie round the edge of the convex upper surface. The under surface is smooth and slightly concave, and has a few small oscula scattered over it. The third specimen (R.N. VI. 20 *a*) is erect, flabellate, with oval outline, attached to a rock by a short, thick stem; it is 35 mm. high, 28 mm. wide, and about 6 mm. thick; there is a single osculum on one side. The fourth specimen (R.N. VI. 22) is a small oval fragment which has probably been torn off a larger one.

The surface is for the most part minutely conulose, the conuli being more marked in some places than others, while in parts it is quite smooth; there

are also narrow meandering grooves, covered in life by the thin dermal membrane. Colour in spirit purplish brown in parts, lighter brown in others; texture compact and compressible, resilient, but tough.

There is a thin but well-developed cortex of sand and broken spicules; this cortex is usually of a minutely reticulate nature, the meshes being about 0·13 mm. in diameter and containing inhalant pore-areas. In other parts the cortex seems continuous.

The skeleton consists of primary fibres about 0·05 mm. in diameter, running vertically to the surface and containing much foreign matter (broken spicules); the secondary connecting fibres, which average about 0·02 mm. in diameter, form a close network with somewhat irregular, polygonal meshes about 0·2 mm. wide.

There is a very well developed collenchymatous ectosome, in which lie large subdermal cavities. The canal system resembles closely that of *Euspongia*. Some of the larger canals in the choanosome are surrounded by a thick layer of collenchyma. The flagellate chambers are small, subspherical, and about 0·03 mm. in diameter; they are either eurypylous or with very short canaliculi, and closely packed together. The mesoglœa between them is very finely granular. Embryos are present, some in an advanced state of development.

Hyatt [1877] described two sponges, *Spongelia incerta* and *Spongelia spinosa*, which Lendenfeld [1889] makes synonymous with his *Coscinoderma pyriforme*. We can find nothing in Hyatt's description to justify this.

Register Nos. and Localities. II. 7 *a*, III. 7, Wooded Isle; VI. 20 *a*, VI. 22, Sandy Isle.

48 *a*. Coscinoderma pyriforme *Lendenfeld*, var. *β*.

Coscinoderma pyriforme Lendenfeld [1889].

The single specimen, which measures 25 mm. in greatest height, 55 mm. in greatest width, and has an average thickness of 10 mm., is a flattened, cup-shaped sponge with irregular but entire margin; it has probably been attached to a rock at several points on its convex lower surface. Colour in spirit dark brown on the upper surface, greyish brown on the lower; texture fine, compact, compressible.

The upper surface is very minutely conulose, subglabrous, and has a well-marked but thin, minutely reticulate cortex made up mostly of broken spicules. Inhalant pore-areas lie in the meshes of the cortex. There are no visible oscula on this surface. The lower surface is smooth and has a thin, continuous cortex formed of broken spicules, no inhalant pore-areas being visible; a number of closed oscula are scattered over this surface, surrounded by radiating subdermal exhalant canals.

The skeleton arrangement and the structure of the soft tissues agree closely with those of *Coscinoderma pyriforme* var. *α*. A large number of small,

darkly staining, spherical cells, about 0·006 mm. in diameter, are found embedded in the mesogloea : these cells are most abundant around the various parts of the inhalant canal-system and congregated in immense numbers in the inner portion of the ectosome : they are probably symbiotic algæ such as are known to occur frequently in sponges.

Register No. and Locality. IV. 5, Wooded Isle.

List of Literature referred to.

1921. Babić, K.—"Monactinellida und Tetractinellida der Adria" (Glasnik hrv. prirod. drustva. g. xxxiii. g. 1921, pp. 1–17).

1922. ——— "Monactinellida und Tetractinellida des Adriatischen Meeres" (Zool. Jahrb. Bd. 46, pp. 217–302).

1863. Balsamo-Crivelli, G.—"Di alcuni spongiarj del golfo di Napoli" (Milano Soc. Ital. Atti, vol. v. pp. 284–302).

1866. Bowerbank, J. S.—"A Monograph of the British Spongiadæ, Vol. II." (London).

1873. ——— "Contributions to a General History of the Spongiadæ, Part IV." (Proc. Zool. Soc. London, 1873, pp. 3–25).

1874. ——— "A Monograph of the British Spongiadæ, Vol. III." (London).

1882. ——— "A Monograph of the British Spongiadæ, Vol. IV." (edited, with additions, by the Rev. A. M. Norman. London).

1923. Burton, M.—"A Revision of the Family Donatiidæ." MS.

1870. Carter, H. J.—"On two new Species of Subsphærous Sponges, with Observations" (Ann. & Mag. Nat. Hist. vol. vi. pp. 176–182).

1873. ——— "On two new Species of Gummineæ (*Corticium abyssi, Chondrilla australiensis*), with special and general Observations" (Ann. & Mag. Nat. Hist. vol. xii. pp. 17–30).

1876. ——— "Descriptions and Figures of Deep-Sea Sponges and their Spicules, from the Atlantic Ocean, etc." (Ann. & Mag. Nat. Hist. vol. xviii. pp. 388–410).

1879. ——— "Contributions to our Knowledge of the Spongida" (Ann. &. Mag. Nat. Hist. vol. iii. pp. 284–360).

1882 A. ——— "Some Sponges from the West Indies and Acapulco, in the Liverpool Free Museum, etc." (Ann. & Mag. Nat. Hist. vol. ix. pp. 266–301, 346–368).

1882 B. ——— "New Sponges, Observations on old ones, and a proposed New Group" (Ann. & Mag. Nat. Hist. vol. x. pp. 106–125).

1883. ——— "Contributions to our Knowledge of the Spongida. Pachytragida" (Ann. & Mag. Nat. Hist. vol. xi. pp. 344–369).

1885-6. ——— "Descriptions of Sponges from the Neighbourhood of Port Phillip Heads, etc." (Ann. & Mag. Nat. Hist. vols. xv., xvi., xvii., xviii.).

1886. ——— "Supplement to the Descriptions of Mr. J. Bracebridge Wilson's Australian Sponges" (Ann. & Mag. Nat. Hist. vol. xviii. pp. 445–466).

1887 A. ——— "Report on Marine Sponges, chiefly from King Island, in the Mergui Archipelago, etc." (Journ. Linn. Soc., Zool. vol. xxi. pp. 61–84).

1878. Czerniavsky, Vladimir.—"The littoral Sponges of the Black and Caspian Seas: Preliminary Report" (Mosc. Soc. Nat. Bull. vol. liii. pt. 2, pp. 375–397).

1889. Dendy, A.—"Report on a Second Collection of Sponges from the Gulf of Manaar" Ann. & Mag. Nat. Hist. vol. iii. pp. 73–99).

1891. ——— "Monograph of the Victorian Sponges: Part I. The Organisation and Classification of the Calcarea Homocœla, with Descriptions of the Victorian Species" (Trans. R. Soc. Vict. vol. iii. pp. 1–82).

1892. Dendy, A.—"Synopsis of the Australian Calcarea Heterocœla, with a proposed Classification of the Group, and Descriptions of some new Genera and Species" (Proc. Roy. Soc. Vict. (new series), v. pp. 69–116).

1893 A. ——— "Studies on the Comparative Anatomy of Sponges: V. Observations on the Structure and Classification of the Calcarea Heterocœla" (Q. J. M. S. (n. s.), No. 138, pp. 159–257).

1893 B. ——— "Studies on the Comparative Anatomy of Sponges: VI. On the Anatomy and Relationships of *Lelapia australis*, a living Representative of the fossil Pharetrones" (Q. J. M. S. (n. s.), No. 142, pp. 127–142).

1896. ——— "Catalogue of Non-Calcareous Sponges collected by J. Bracebridge Wilson, etc., Part 2" (Proc. Roy. Soc. Victoria, vol. viii. pp. 14–51).

1897. ——— "Catalogue of Non-Calcareous Sponges collected by J. Bracebridge Wilson, etc., Part 3" (Proc. Roy. Soc. Victoria, vol. ix. pp. 230–259).

1905. ——— "Report on the Sponges collected by Prof. Herdman at Ceylon in 1902" (Report Pearl Oyster Fisheries, Roy. Soc. London, Part 3, pp. 57–246).

1913. ——— "Report on the Calcareous Sponges collected by H.M.S. 'Sealark' in the Indian Ocean" (Trans. Linn. Soc. (ser. 2), Zool. vol. xvi. 1913, pp. 1–29).

1916 A. ——— "Report on the Non-Calcareous Sponges collected by Mr. James Hornell at Okhamandal, etc." (Report to the Government of Baroda on the Marine Zoology of Okhamandal in Kattiawar, Part 2, pp. 93–146. London: Williams & Norgate).

1916 B. ——— "Report on the Homosclerophora and Astrotetraxonida collected by H.M.S. 'Sealark' in the Indian Ocean" (Trans. Linn. Soc. (ser. 2), Zool. vol. xvii. pp. 225–271).

1921 A. ——— "The Tetraxonid Sponge Spicule: A Study in Evolution" (Acta Zoologica, vol. ii. pp. 95–152).

1921 B. ——— "Report on the Sigmatotetraxonida collected by H.M.S. 'Sealark' in the Indian Ocean" (Trans. Linn. Soc. (ser. 2), Zool. vol. xviii. pp. 1–164).

1913. Dendy, Arthur, and R. W. Harold Row.—"The Classification and Phylogeny of the Calcareous Sponges, with a Reference List of all the described Species, systematically arranged" (Proc. Zool. Soc. London, 1913, pp. 704–813).

1914. Ferrer Hernandez, F.—"Espoujas del Cantabrico. Parte segunda: III. Myxospongida, IV. Tetraxonida, V. Triaxonida" (Trab. Mus. Nac. Cienc. nat., Madrid, Ser. Zool. No. xvii.).

1867. Gray, J. E.—"Notes on the Arrangement of Sponges, with the Descriptions of some new Genera" (Proc. Zool. Soc. 1867, pp. 492–558).

1872. Haeckel, E.—"Die Kalkschwämne: eine Monographie" (Berlin).

1912. Hallmann, E. F.—"Report on the Sponges obtained by the F.I.S. 'Endeavour' on the Coasts of New South Wales, Victoria, South Australia, Queensland and Tasmania. Part I." (Commonwealth of Australia Fisheries. Zool. Results of the Fishing Experiments carried out by the F.I.S. 'Endeavour,' 1909–1910, Part II. pp. 115–300).

1914. ——— "A Revision of the Monaxonid Species described as new in Lendenfeld's Catalogue of the Sponges in the Australian Museum. Part I." (Proc. Linn. Soc. N.S.W., Sydney, vol. xxxix. pp. 263–315).

1916. ——— "A Revision of the Genera with Microscleres included, or provisionally included, in the Family Axinellidæ; with Descriptions of some Australian Species. Parts 1 and 2" (Proc. Linn. Soc. N.S.W. vol. xli. pp. 453–491 & 495–582).

1917. ——— "*Op. cit.* Part 3" (Proc. Linn. Soc. N.S.W. vol. xli. pp. 634–675).

1894. Hara, J.—"On a new species of Calcareous Sponge, *Lelapia nipponica*" (Ann. Mag. Zool. Soc. Tokyo (Tokyo Dobutsugaku Zashi), vol. vi. pp. 359–370, pl. viii.).
1909. Hentschel, E.—"Tetraxonida. Th. 1" (Die Fauna Südwest-Australiens, Bd. ii. pp. 347–402. Jena: G. Fischer).
1911. ——— "Tetraxonida. Th. 2" (Die Fauna Südwest-Australiens. Bd. iii. pp. 279–393. Jena: G. Fischer).
1912 ——— "Kiesel- und Hornschwämme der Aru- und Kei-Inseln" (Abh. Senckenberg nat. Ges. Bd. xxxiv. pp. 291–448).
1923. Hōzawa, Sanji.—"On a new Genus of Calcareous Sponge" (Annotationes Zoologicæ Japonenses, vol. x. article 18).
1877. Hyatt, A.—"Revision of the North American Poriferæ. Part II." (Boston Soc. Nat. Hist. Mem. vol. ii. pp. 481–554).
1880. Keller, C.—"Neue Cœlenteraten aus dem Golf von Neapel" (Archiv. Mikrosk. Anat. vol. xviii. 1880, pp. 271–280).
1900. Kirkpatrick, R.—"On the Sponges of Christmas Island" (Proc. Zool. Soc. London, 1900, pp. 127–141).
1864. Kölliker, A. von.—"Icones Histiologicæ oder Atlas der vergleichenden Gewebelehre. I. Der feinere Bau der Protozoen" (Leipzig).
1813. Lamarck, J. B. P. A. de M. de.—"Sur les Polypiers empâtés: Éponges" (Ann. Mus. Hist. Nat. Paris, vol. xx. pp. 294–312, 370–386, 432–458).
1885. Lendenfeld, R. von.—"A Monograph of the Australian Sponges. Part III.: The Calcispongiæ" (Proc. Linn. Soc. N.S.W. vol. ix. 1885, pp. 1083–1150).
1886. ——— "A Monograph of the Australian Sponges. Part IV.: The Myxospongiæ" (Proc. Linn. Soc. N.S.W. vol. x. pp. 3–22).
1887. ——— "Die Chalineen des australischen Gebietes" (Zool. Jahrb. vol. ii. pp. 723–828).
1888. ——— "Catalogue of Sponges in the Australian Museum" (Sydney, N.S.W.).
1889. ——— "A Monograph of the Horny Sponges" (Published for the Roy. Soc. by Trübner & Co.).
1896. ——— "Die Clavulina der Adria" (Nova Acta Acad. Leopoldino-Carolinæ, T. lxix. pp. 1–251).
1897. ——— "Spongien von Sansibar" (Wiss. Ergebn. Madagaskar Ostafr. Abh. Senckenb. nat. Ges. Bd. xxi. pp. 93–133).
1903. ——— "Tetraxonia" (Das Thierreich, Lief. xix.).
1906. ——— "Die Tetraxonia" (Wiss. Ergebn. deutsch. Tiefsee-Exp. Bd. xi. Lief. ii.).
1897. Lindgren, N. G. "Beitrag zur Kenntnis der Spongienfauna des Malayischen Archipels und der chinesischen Meere" (Zool. Anzeiger, Bd. xx. pp. 480–487).
1898. ——— "Beitrag zur Kenntnis der Spongienfauna des Malayischen Archipels und der chinesischen Meere" (Zool. Jahrbuch, Abth. Syst. Bd. xi. pp. 283–378).
1902 Lundbeck, W.—"Porifera. Part I." (Danish Ingolf-Expedition, vol. vi. Copenhagen).
1900. Minchin, A. E.—"Porifera" ('A Treatise on Zoology,' edited by E. Ray Lankester).
1893. Ostroumov.—"Liste des Spongiaires de la Mer Noire tirée des travaux de Mr. Czerniavsky" (Cong. Zool. 2e sess. Moscou (1892), part 2, pp. 159–160).
1883. Poléjaeff, N. de—"Calcarea" ('Challenger' Reports, Zoology, vol. viii.).
1881. Ridley, S. O.—"On the Genus *Plocamia* Schmidt (*Dirrhopalum*), and some other Sponges of the Order Echinonemata" (Journ. Linn. Soc., Zool. vol. xv. pp. 476–487, 493–497).

1884. Ridley, S. O.—"Spongiida" (Report on the Zoological Collection made in the Indo-Pacific Ocean during the voyage of H.M.S. 'Alert' in 1881–2, pp. 366–482, 582–630).

1887. Ridley, S. O., and Dendy, A.—"Report on the Monaxonida" ('Challenger' Reports, Zoology, vol. xx.).

1911. Row, R. W. H.—"Report on the Sponges collected by Mr. Cyril Crossland in 1904–5" (Reports on the Marine Biology of the Sudanese Red Sea. Journ. Linn. Soc., Zool. vol. xxxi. pp. 287–400).

1862. Schmidt, O.—"Die Spongien des Adriatischen Meeres" (Leipzig).

1864. ——— "Supplement der Spongien des Adriatischen Meeres" (Leipzig).

1868. ——— "Die Spongien der Küste von Algier, etc." (Leipzig).

1880. ——— "Zusatz zu "Neue Cœlenteraten aus dem Golf von Neapel" von C. Keller' (Arch. Mikr. Anat. vol. xviii. 1880, pp. 280–282).

1888. Sollas, W. J.—"Report on the Tetractinellida" ('Challenger' Reports, Zoology, vol. xxv.).

1905. Swartschewsky, B.—"Beitrag zur Kenntnis des Schwamm-Fauna des Schwarzen Meeres" (Mém. Soc. Nat. Kiew, T. 20).

1900. Thiele, J.—"Kieselschwämme von Ternate, I." (Abh. Senckenb. Nat. Ges. Bd. xxv. pp. 17–80).

1888. Topsent, E.—"Contribution à l'Étude des Clionides" (Arch. Zool. Exp. et Gén. v. Suppl. vi. pp. 407–496).

1889. ——— "Quelques Spongiaires du Banc de Campêche et de la Point-à-Pitre" (Mém. Soc. Zool. France, II. i. pp. 30–52).

1892. ——— "Diagnoses d' ponges nouvelle de la Mediterranée et plus particulièrement de Banyuls" (Arch. Zool. Exp. et Gén. (2) x. pp. 26–32, 65–71).

1894. ——— "Application de la taxonomie actuelle à une collection de Spongiaires du banc de Campêche et de la Guadeloupe décrite précédement" (Mém. Soc. Zool. France, vii. (1894) pp. 27–37).

1896. ——— "Matériaux pour servir à l'Étude de la Faune des Spongiaires de France" (Mém. Soc. Zool. France, ix. 1, pp. 113–133).

1897. ——— "Spongiaires de la Baie d'Amboine" (Rev. Suisse Zool. vol. iv. pp. 421–487).

1898. ——— "Sur les Hadromerina de l'Adriatique" (Bull. Soc. Scient. Méd. Ouest, T. 7, pp. 117–130).

1900. ——— "Étude monographique des Spongiaires de France. III. Monaxonida (Hadromerina)" (Arch. Zool. Exp. et Gén. (3) viii. pp. 1–331).

1906. ——— "Éponges recueillies par M. Ch. Gravier dans la Mer Rouge" (Bull. Mus. Hist. Nat. Paris, 1906, pp. 557–570).

1918. ——— "Éponges de San Thomé. Essai sur les genres *Spirastrella*, *Donatia* et *Chondrilla*" (Archives de Zoologie Expérimentale et Générale, Tome 57 Fascicule 6, pp. 535–618).

1887. Vosmaer, G. C. J.—"Porifera" (Bronn's 'Klassen und Ordnungen des Thierreichs,' vol. ii.).

1911. ——— "The Porifera of the 'Siboga' Expedition. II. The Genus *Spirastrella*" ('Siboga' Expedition Monographs).

1901. Whitelegge, T.—"Report on Sponges from the Coastal Beaches of New South Wales" (Records of the Australian Museum, vol. iv. pp. 55–118).

1902. Wilson, H. V.—"The Sponges collected in Porto Rico in 1899 by the U.S. Fish Commission Steamer 'Fish Hawk'" (Bull. U.S. Fish Comm. 1900, vol. ii. pp. 375–411).

EXPLANATION OF THE PLATES.

Plate 25.

(All the figures in this plate are from photographs.)

Fig. 1. *Leucosolenia grisea* n. sp. R.N. VI. 21. × 1½.
2. *Leucosolenia protogenes* Hæckel. R.N. VIII. 4. × 2.
3. *Ascoleucetta compressa* n. sp. R.N. III. 12. × 2.
4. *Vosmaeropsis mackinnoni* n. sp. R.N. IV. 1. × 1½.
5. *Grantiopsis cylindrica* Dendy. R.N. VII. 1 *a*. × 3½.
6. *Grantiopsis cylindrica* Dendy. R.N. VII. 1 *b*. × 3.
7. *Grantiopsis cylindrica* Dendy. R.N. VI. 17 *c*. × 2.
8. *Grantiopsis cylindrica* Dendy. R.N. I. 1. × 2.
9. *Grantiopsis cylindrica* Dendy var. *fruticosa* nov. R.N. III. 4. × 2.
10. *Lelapia antiqua* n. sp. R.N. VII. 1 *e*. × 2¼.
11. *Ancorina australiensis* Carter. R.N. VI. 6 *a*; encrusted by *Spongelia dakini* n. sp., R.N. VI. 6 *b*. × 1.
12. *Reniera aquæductus* Schmidt. R.N. VII. 3. × 1.
13. *Anchinoë fictitioides* n. sp. R.N. VI. 4. × ½.
14. *Sigmosceptrella fibrosa* Dendy. R.N. VI. 2. × ¾.
15. *Megalopastas arenifibrosa* n. sp. R.N. VI. 3. × $\frac{7}{10}$.

Plate 26.

Fig. 1. *Leucosolenia grisea* n. sp. R.N. VI. 21.
a. Triradiates, × 150; *b*. Quadriradiates, × 150.

Fig. 2. *Ascoleucetta compressa* n. sp. R.N. III. 12.
a. Large triradiates, × 60; *b*. Small triradiates, × 150; *c–e*. Quadriradiates, × 150

Fig. 3. *Ascoleucetta compressa* n. sp. R.N. III. 12. Diagrammatic vertical section through margin, showing canal-system. × 20.
i.a., inhalant apertures; *d.cor.*, dermal cortex; *i.c.*, inhalant canal; *fl.ch.*, flagellate chamber; *ex.o.*, exhalant opening of chamber; *ex.c.*, exhalant canal; *osc.*, osculum; *mes.*, mesoglœa.

Fig. 4. *Ascoleucetta compressa* n. sp. R.N. III. 12. Portion of similar section. × 60.
c.c., collared cells; *pr.*, prosopyle; *tr.*, large triradiates of dermal cortex (*d.c.*); *a.r.*, apical rays of quadriradiates projecting into flagellate chamber and exhalant canal. Other lettering as before.

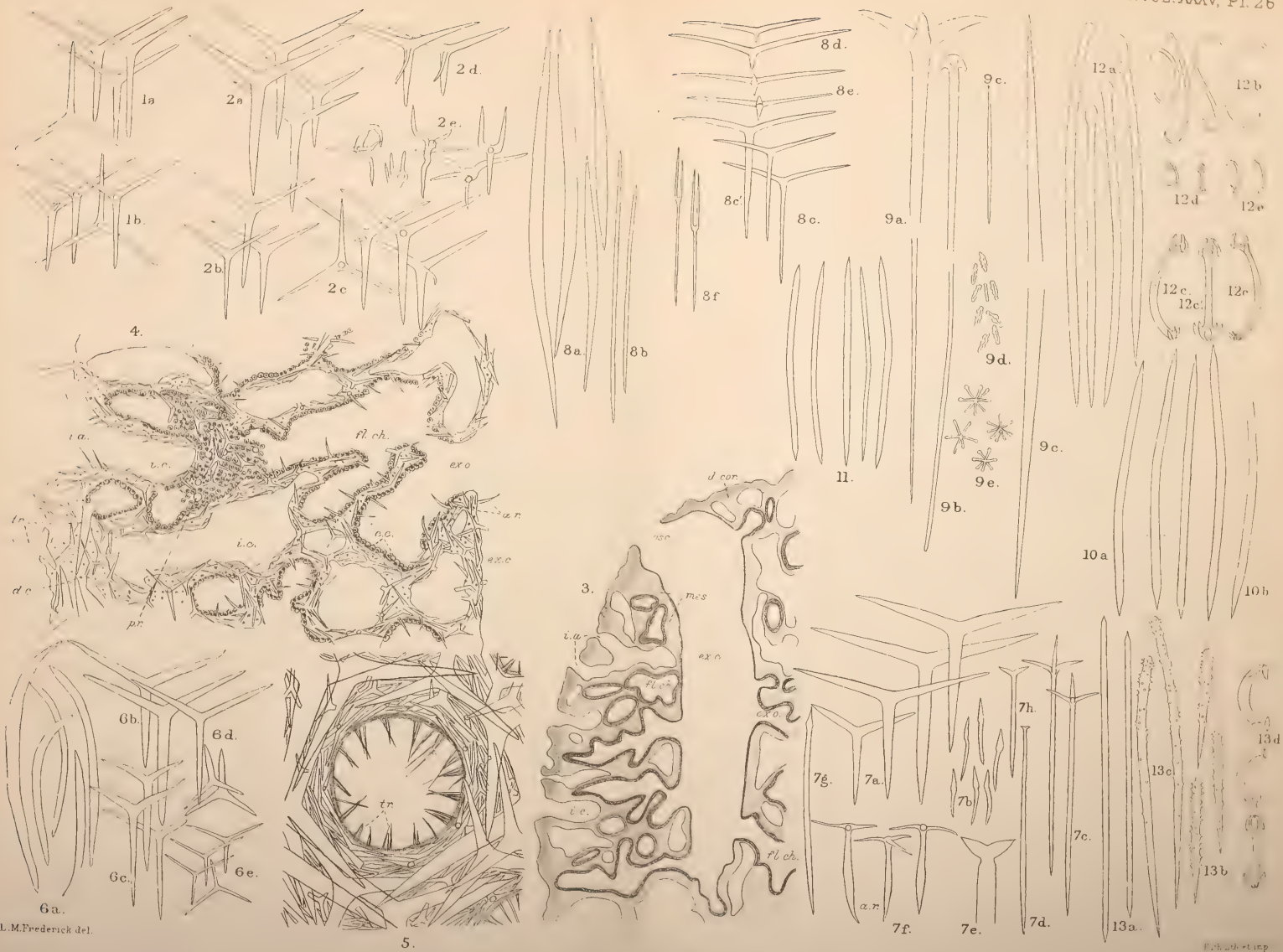
Fig. 5. *Ascoleucetta compressa* n. sp. R.N. III. 12. Dermal surface, showing skeleton arrangement round inhalant aperture, × 100.
tr., trichoxea.

Fig. 6. *Vosmaeropsis mackinnoni* n. sp. R.N. VI. 1.
a. Large oxea, × 40; *b*. Subgastral or tubar sagittal triradiates, × 40; *c*. Subdermal pseudo-sagittal triradiates, × 40; *d*. Triradiates of the dermal cortex, × 40; *e*. Triradiates of the gastral cortex, × 40.

Fig. 7. *Grantiopsis cylindrica* Dendy. R.N. I. 1.
a. Triradiates of dermal cortex, × 60; *b*. Dermal microxea, × 150; *c*. Subgastral quadriradiates, × 150; *d*. Reduced tubar triradiate, × 150; *e*. Head of tubar triradiate, showing the two vestigial rays, × 950; *f*. Gastral quadriradiates, × 150; *a.r.* apical ray; *g*. Oxeote from oscular fringe, × 150; *h*. Oscular triradiate, × 150.

SPONGES FROM ABROLHOS ISLANDS.

Huth coll.



SPONGES FROM ABROLHOS ISLANDS.

Fig. 8. *Lelapia antiqua* n. sp. R.N. VII. 1 *e*.

a. Large oxea, × 40; *b*. Slender oxea from dermal brushes, × 40; *c*. Normal sagittal triradiates of dermal cortex, × 60; *c'*. Subgastral sagittal triradiate, × 60; *d*. Alate triradiates of gastral cortex, × 60; *e*. Alate quadriradiates of peristome, × 60; *f*. "Tuning-fork" spicules, × 60.

Fig. 9. *Ancorina brevidens* n. sp. R.N. VI. 16 *b*.

a. Orthotriæne, × 100; *b*. Anatriæne, × 100; *c*. Large oxeote, × 100; *c'*. Small ectosomal oxeote, × 100; *d*. Microrhabds, × 360; *e*. Tylasters, × 360.

Fig. 10. *Halichondria phakellioides* n. sp. R.N. VI. 1.

a. Oxea, × 100; *b*. Stylote, × 100.

Fig. 11. *Phlœodictyon abrolhosensis* n. sp. R.N. II. 9.

Oxea, × 190.

Fig. 12. *Pseudoesperia carteri* n. sp. R.N. II. 15.

a. Tylostyli, × 270; *b*. Sigmata, × 550; *c*. Quadridentate anisochela, side view, × 550; *c'*. Quadridentate anisochela, face view seen from the back, × 550; *c''*. Young quadridentate anisochela, side view, × 550; *d*. Small semi-bipocillate anisochelæ, × 550; *e*. Small palmate anisochelæ, × 550.

Fig. 13. *Anchinoë fictitioides* n. sp. R.N. VI. 4.

a. Tornotoxea, × 190; *b*. Small acanthostyli, × 190; *c*. Long acanthostyli, × 190; *d*. Tridentate anisochelæ (chelæ arcuatæ), × 650.